

numerous rivulets and streams, dense forest areas, lush green paddy fields, and a per-humid climate with high rainfall, making it susceptible to floods.

10.2.1 Forests

An important aspect about the location of Dhemaji Planning Area is that it is in the vicinity of forests. In fact, there are 9 notified reserve forests in Dhemaji Forest Division namely, Jiadhal, Subansiri, Sissi, Simen, Archiac, Jamjing, Senga, Gali and Pova, covering an area of around 495.54 sq km which constitutes around 18.1 percent of the total geographical area of the division. The Jiadhal Reserve Forest, which has an area of around 18.16 sq km, is situated quite close to the Dhemaji town and a small part of it falls within the Dhemaji Planning Area.

According to a report submitted by the Department of Environment and Forests, Dhemaji, nearly 14.50 sq km of land in the Jiadhal Reserve Forest has been encroached. The encroachment took place majorly from 1960-1980. Since then, multiple action plans have been submitted to the higher authorities to combat the issue of encroachments, but the implementation of these plans has been a challenge. Apart from this, illegal felling of trees and man-animal conflicts related to various installations in forest areas are some of the major issues.

10.2.2 Water bodies

Jiadhal, a sub-tributary of the river Brahmaputra, is the major river flowing close to the Dhemaji Planning Area. In the hills of Arunachal Pradesh, three small rivulets, Siri, Sika and Sido, converge and flow towards the plains as one river, Jiadhal. The river then flows through the Dhemaji district and finally joins Subansiri, a tributary of the Brahmaputra.

Jiadhal sub-basin covers an area of 533.48 sq km extending from 27°15'N to 27°45'N latitude and 94°15'E to 94°40'E longitude. The rainfall intensity in the sub-basin is quite high. This high rainfall intensity adds excessive silt discharge to the river, resulting in a braided patterned flow. As a result, severe erosion and avulsion in the natural course of the river takes place, particularly during the monsoon, adversely affecting the lives of people downstream. The river Jiadhal has been creating flood and erosion problems almost every year. To tackle this issue, several embankments have been created but due to the meandering nature of the river, these embankments have been breached multiple

times and require regular repair and maintenance. The reason behind this is that Jiadhal carries excessive silt discharge and deposits on the river bed while flowing downstream from the hilly catchments, thereby raising its own bed. As a result, during the rainy season, it is unable to carry its own discharge safely and spills the banks. Sometimes, complete avulsion takes place, and the river forms a new course of its own in a different direction. Due to this, the river has breached its embankments more than 19 times since 1983. Almost every year, NH15 and the railway track get washed away by the turbulent flow of Jiadhal when the velocity of the river flow goes up to 5 meters per second. The flooding events hence caused result in the devastation of crops in the area, which has become a cause of concern for the residents and government officers. For this reason, Jiadhal is known as the 'River of Sorrow' for the people of Dhemaji.

Apart from this, small rivulets like Telijan and Eradhal flow through Dhemaji town. However, over the years, these rivulets have turned into *nalas* and water flows through them only during the rainy season. Often, waste is dumped in and around these rivulets, resulting in the spread of vector-borne diseases.

Dhemaji Planning Area has a good number of *beels* and marshes which are fed mainly by rainfall. Water from these *beels* is a significant source of groundwater recharge and is often used by farmers for irrigation. Some *beels* are used for fishing, harvesting plants, bathing, wallowing domestic animals and plying boats by people and therefor, have significant cultural and religious values attached to them.

Dhemaji has extensive plain areas, suitable for cultivation but due to improper land use planning and unplanned construction, a huge chunk of land becomes waterlogged due to excessive rainwater as well as flood water. Some of these areas dry out during winter while some remain as ditches, cesspools or waterlogged *beel* areas. In addition, some areas are sand casted by flash floods caused by embankment breaches.

10.3 Air and Water Pollution

Air quality in Dhemaji town is not a major concern at present as it normally lies in the moderate category with an Air Quality Index of 80. The major pollutant is PM_{2.5}, the concentrations of which reaches devastating levels of 30.2 µg/m³, which is 6 times above the WHO annual air quality guideline value. PM_{2.5} is the fine particulate matter in the air that reduces visibility and causes air to appear hazy when its levels are elevated.

So, with the rapid urban transformation, Dhemaji Master Plan must ensure that the air pollution levels remain under a check in the future.

Water pollution in Dhemaji is also a serious issue, particularly with respect to ground water, which is the main source of water supply in Dhemaji Municipal Area. The Central Ground Water Board has conducted a study to examine the ground water quality in Dhemaji. Water samples from the region's Ground Water Monitoring Stations (GWMS) were collected to measure the chemical purity of ground water and its suitability for drinking and irrigation. Most physical indices, such as pH, Total Dissolved Solids (TDS), calcium, magnesium, chlorine and carbonate content, were found to be within the permissible ranges for shallow aquifers. Fluoride concentration ranged from 0.30 to 2.50 ppm during pre-monsoon and from 0.05 to 0.58 ppm during post-monsoon. This implies that the post-monsoon fluoride concentration is within the acceptable limit, but the pre-monsoon concentration was found to be unsuitable for drinking. However, for deeper aquifers, all metrics were found to be within the permissible limits. As a part of this study, chemical parameters to assess ground water quality in Dhemaji were also measured. These parameters revealed significant concentrations of various dangerous elements like iron and arsenic, which were found to be higher than the permissible limits set by the Bureau of Indian Standards (BIS) and WHO. A study by the North-eastern Regional Institute of Water and Land Management (NERIWALM) also made a similar claim.

However, clinical manifestations of arsenic are quite uncommon till date among the people living in the area. The chemical quality of ground water in Dhemaji showed high concentration of some harmful elements. Keeping in view this, it is advisable to test the potability of ground water before using it for drinking and cooking purposes. A long-term water quality monitoring programme is quintessential to blunt the danger from such pollutants. For this, monitoring regimes for testing the chemical quality of ground water as well as the formulation of future ground water development programmes and drinking water management strategies must be given greater significance.

10.4 Natural Disasters

A natural disaster is an event or phenomenon occurring as a result of the natural processes of earth that has the potential to cause widespread human, material,

economic and environmental losses. Dhemaji is frequently affected by natural disasters like floods, erosion, storms and at times, earthquakes, of which floods are the most devastating disaster every year, causing immense loss to standing crops and damage to public property.

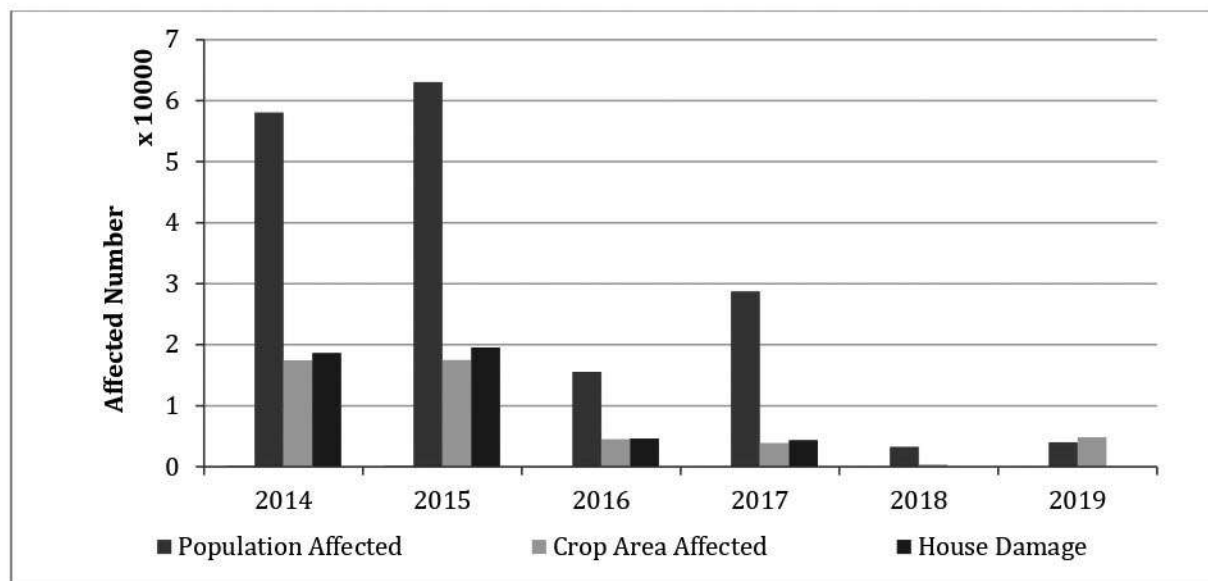
10.4.1 Floods

Due to its geographical location and topography, numerous tributaries flow out of Arunachal Pradesh towards Dhemaji, forming an intricate network of rivers. These rivers swell up during the rainy season, thereby flooding the villages lying along the banks. These floods, which last from a few days up to weeks, completely disrupt the lives of people. The floodwater carries large sediments from the hills to the plains of Dhemaji causing huge devastation due to sand and silt deposition. After the flood water recedes, the resulting siltation leads to degradation of the cultivable agriculture land in the region, which is a serious, recurring problem. Majorly, floods are experienced in the western part of the Dhemaji Planning Area which lies close to Jiadhal river.

Being an area experiencing one of the heaviest rainfalls in Assam, floods are a regular annual phenomenon in Dhemaji. It is believed that the Great Earthquake of 1950 left the entire riverine system of the area severely disturbed and since then, the region has been witnessing severe floods. The shifting of channels is so abrupt and uncertain that the entire Dhemaji Planning Area can be said to be a flood plain area. Flood prone zones in Dhemaji Planning Area have been highlighted in **Figure 10.1**. The worst affected villages falling within the Dhemaji Planning Area include Tinigharia, Hesuli, Panitula, Chengeli Pathar, Gohain Gaon, Moridhal, etc.

Within the town, the problem of urban flooding does exist, particularly in the low-lying residential areas with narrow streets and poor drainage system.

According to the flood damage report from 2014-2019, the flood damage in Dhemaji sub-division has decreased considerably but has not yet been fully mitigated. In the year 2019, nearly 36 villages in Dhemaji block were affected by floods, having an adverse impact on the lives of 4,019 people and damaging 48.29 sq km of land as shown in **Figure 10.2**.

Figure 10.2: Flood Damage Assessment for Dhemaji Block, 2014-2019

Source: District Disaster Management Authority, Dhemaji (2021).

10.4.2 Erosion

Erosion is one of the most severe and hazardous natural disasters in Dhemaji, affecting critical infrastructure such as bridges, roads and culverts and earthen canals as well as agricultural lands, rural habitations, embankments and bunds. Several hectares of cultivable land in villages have borne the impact of erosion in the Dhemaji Planning Area. This is particularly true for villages located along the vicinity of Jiadhal river. Erosion occurs mainly because of the reasons stated below:

- i. Abrasion or Corrasion: Extensive deforestation in the upper reaches of Arunachal Pradesh increases sediment load in Jiadhal which scours the bed and banks in the floodplain.
- ii. Hydraulic action: The river water hits the riverbanks with a lot of force, and penetrates deep through the cracks. This increase in pressure causes the riverbank to collapse.

The effects of erosion are felt the most from June to October. As per the District Disaster Management Plan, nearly 1,115 families have been affected and 910 hectares of land has been eroded in Dhemaji block between 2011 and 2021. Erosion, therefore, is a serious issue in Dhemaji and calls for a mitigation plan which needs to be incorporated within the master plan.

10.4.3 Earthquake

Like any other part of Assam, Dhemaji town falls under the seismic zone V, highly vulnerable to earthquakes. It has a strategic location where steep slopes of Eastern Himalayas abruptly drop, forming a narrow valley, which widens towards the western side. Numerous drainage systems originating from the hills of Arunachal Pradesh flow through this narrow valley ending at the mighty river Brahmaputra. In general, the slope of the entire district drops from northern and eastern corners towards the southern and western sides.

Although big earthquakes have not been reported for quite some time, there is a great possibility of their occurrence, especially given the fact that it has been 70 years since the last major earthquake. The Great Earthquake of 1950 caused widespread damage to the region's forests and riverine ecosystems. The riverbeds rose which became the main cause of river course changes leading to erosion of forests in the area. Even today, shocks of various intensities are felt from time to time. In fact, the whole of northeast India is a tectonically active zone due to the presence of active thrusts, fault planes and fragile loose sediments, leading to frequent landslides in the hilly areas. The courses of rivers are also influenced by these active tectonic lineaments.

10.5 Conclusions

Dhemaji has abundant water resources and a complex geomorphology. Its environment is prone to damage, particularly in areas vulnerable to several natural hazards. High iron and arsenic content in drinking water sources remains a major concern. Therefore, the presence of harmful elements in shallow ground water must be carefully assessed and water from deep aquifers alone should be provided for drinking purpose. With an even distribution of small water bodies throughout the urban area, Dhemaji has huge potential for developing its water resources. But above observations suggest that these water bodies require proper maintenance and quality checks.

Floods and erosion are the major natural hazards that need to be dealt with. Loss of life, property, livestock and croplands because of floods is still a serious issue. The area lies in high seismic risk zone making it vulnerable to earthquakes. Therefore, the Master Plan could consider making careful consideration for disaster mitigation strategies with adequate provisions for relief shelters, damage prevention and rescue plans.

CHAPTER 11: GOVERNANCE AND FINANCE

11.1 Introduction

A well-governed and financially stable city is quintessential for any plan, policy or strategy to be successfully executed. This chapter discusses and analyses the existing governance, administration, and financial setup within Dhemaji to come up with effective, and efficient planning measures for the betterment of the administration of the town.

There are 78 urban local bodies (ULB) in Assam which can be classified into three categories: (a) Municipal Corporation, serving a large population and area; (b) Municipal Board, for a smaller urban area and population and (c) Town Committee, for towns which are relatively small. At present, there is one Municipal Corporation, 34 Municipal Boards and 63 Town Committees in Assam.

In 1977, Dhemaji Municipal Board was constituted to govern all the aspects related to the development and maintenance of the town. The first election of the Board was held in January 1993.

11.2 Institutional Framework

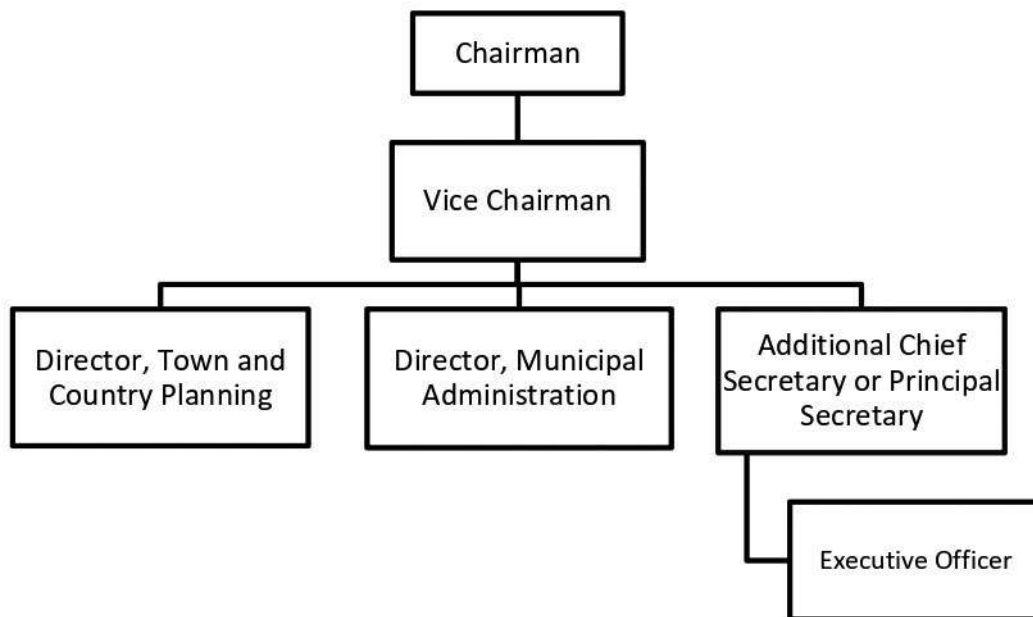
A well-functioning ULB must have the framework to sustain itself in terms of financial and functional autonomy, that is, local finance and its own revenue. It should further ensure the implementation of all the 18 obligatory functions transferred to it under the 74th Constitutional Amendment Act (CAA) operationalizing the Directive Principles of State Policy. The Dhemaji Municipal Board is governed by the provisions of Assam Municipal Act 1956, and the Assam Municipal Accounts Rules, 1961. Out of the 18 subjects of the 74th CAA, the following nine subjects included in Schedule XII are being undertaken by the Municipal Board:

- Water supply for domestic, industrial, and commercial purposes.
- Conservancy and solid waste management.
- Slum improvement and up-gradation.
- Provision of amenities like parks, gardens, playgrounds.
- Burial and cremation grounds.
- Cattle ponds.

- Street lighting, parking lots, bus stops.
- Regulation of slaughterhouses.
- Roads and drainage.

Average area for Municipal Boards and Town Committees in the state of Assam is 8.56 sq km. and 3.71 sq km. respectively. As per the Census of India, 2011 the average population size of Municipal Boards and Town Committees in Assam is 49,185 and 14,786, respectively. However, the Dhemaji Municipal Board caters to a population of 29,931 as per Census of India, 2011, and has a total of 10 wards under its jurisdiction covering an area of 18.80 sq km. This makes it one of the less populous ULBs as compared to the state average. Bigger towns like Dibrugarh, Silchar, and Nagaon cater to population sizes of more than one lakh.

Generally, the Municipal Board comprises of not less than 10 but not more than 30 elected members. Besides, there is a provision to appoint members, without voting rights, having special knowledge or experience in municipal administration and local Member of Parliaments (MPs) or Member of Legislative Assembly (MLAs) as ex-officio members. There is also a provision for reservation of seats for women, SCs and STs as stipulated in the Constitution Amendment Act 1992. Dhemaji Municipal Board functions under a democratically elected body headed by the Chairperson. For this, the elected commissioners of the ULB select one Chairman and one Vice-Chairman from amongst themselves. The Additional Chief Secretary or Principal Secretary from the Urban Development Department is the administrative head of the Municipal Board. The Director of Municipal Administration, and the Director of Town and Country Planning are responsible for the allocation of funds as well as for exercising overall control and supervision of functions and schemes at the state level. The Chairperson of the Dhemaji Municipal Board functions as an Executive Officer. There is a provision for the constitution of committees in the Municipal Board to assist the Board in discharging its duties. There is also a provision for the appointment of an Executive Officer to assist the Board in day-to-day administration. The organizational structure of the Dhemaji Municipal Board is shown in **Figure 11.1**. Apart from the administrative staff, there are 17 regular employees, 37 fixed pay employees, and 5 master roll employees working at the Dhemaji Municipal Board. The category-wise number of employees working at the Dhemaji Municipal Board in 2020-21 has been shown in **Table 11.1**.

Figure 11.1: Organisational Structure of Dhemaji Municipal Board, 2021**Table 11.1: Category-wise Number of Employees in Dhemaji Municipal Board, 2020**

Category	Regular	Fixed Pay	Master Roll
Executive Engineer	-	-	-
Assistant Engineer	-	1	-
Junior Engineer	1	-	-
Sectional Assistant	2	-	-
Head Assistant	1	-	-
Senior Assistant	1	-	-
Junior Assistant	2	3	-
Data/Computer Operator	-	1	-
Accountant	-	1	-
Tax Daroga	1	-	-
Tax Collector	5	5	-
Peon	2	-	-
Chowkidar	1	3	-
Driver	-	4	-
Safai Karmcharis	-	1	5
Electrician	1	-	-
Helper	-	2	-
Total			

Source: Dhemaji Municipal Board (2021).

11.3 Schemes and Development Projects

This segment deals with the operational schemes and development projects in Dhemaji town along with the status of their funding till the financial year 2020-21. Dhemaji Municipal Board has received funds for various state and central government schemes.

Allocation of these specific purpose funds for the last five years is shown in **Table 11.2**. While most of the specific purpose funds were granted for one year, funds for the Swachh Bharat Mission and development funds for Solid Waste Management have been granted continuously for the last three years. Devolution funds and the 14th and 15th Finance Commission Grants brought in most of the capital. The financial year 2019-20 received the highest number of development and specific purpose funds, both for the state and the central level schemes.

Table 11.2: Receipts on Specific Purpose Funds and Development Funds in Financial Year, 2020

Head of Receipts	Source of Fund	Amount of Fund (x 1,00,000)				
		2016-17	2017-18	2018-19	2019-20	2020-21
Devolution Grant	State	306.75	72.21	106.31	124.30	66.86
Swachh Bharat Mission	Centre	-	-	15.26	145.02	-
Solid Waste Management	State	-	-	19.71	21.55	1.12
Energy Bill	State	-	-	-	5.96	-
Project Jyoti	State	-	-	-	6.31	-
State Owned Priority Development (SOPD)	State	-	-	-	137.35	-
Pradhan Mantri Awaas Yojana (PMAY-U)	Centre	-	-	-	1.08	-
14th Finance Commission	Centre	-	-	-	92.40	92.64
15th Finance Commissions	Centre	-	-	-	-	190.00
Information, Education and Communication	State	-	-	-	-	0.23

Source: Dhemaji Municipal Board (2021).

Apart from this, the major schemes that are actively being implemented in Dhemaji, particularly in the social welfare sector, are listed below.

- i. **Disability Certificates for Persons with Disabilities:** In the district, screening camps have been held to determine who is eligible for a disability certificate. The certificate is issued by the Joint Director of Health Services, who is the competent authority.
- ii. **Deen Dayal Divyangjan Pension Achoni:** This is a brand-new programme that began in 2018-19. It is regarded as one of the most significant initiatives for all people with disabilities who have a disability certificate (with 40 percent of disability and above). The scheme's goal is to offer each disabled person with a monthly pension of Rs. 1000.
- iii. **Scholarships for students with disabilities:** These scholarships provide financial assistance of Rs. 200 per month to all students with disabilities enrolled in schools and institutions.
- iv. **Persons with Disabilities (PwDs) Rehabilitation Grants:** The Social Welfare Department has launched a scheme, Deen Dayal Divyangjan Punorsanthapon Achoni, for individuals with disabilities, particularly unemployed adolescents with disabilities, to encourage self-employment and rehabilitation. A one-time award of Rs. 20,000 would be given to each beneficiary under the scheme if they are between the ages of 18 and 50 and have completed a skill development training course.
- v. **One-Stop Centre:** The union government's 'One Stop Centre' is a scheme aimed at helping women in need. Dhemaji's One Stop Centre is administered by the Dhemaji Zilla Mahila Samity.
- vi. **Pradhan Mantri Matri Vandana Yojana (PMMVY):** It is a conditional cash transfer programme for pregnant women and lactating mothers for the first live birth. It compensates women for lost wages due to childbirth and childcare, as well as aids in ensuring safe delivery and healthy nutrition and feeding practises. Under this scheme, pregnant women and lactating mothers will receive a monetary benefit of up to Rs. 5000 in three instalments before and after the child's birth.
- vii. **POSHAN Abhiyaan:** Prime Minister Narendra Modi launched 'POSHAN (Prime Minister Overarching Scheme for Holistic Nourishment) Abhiyaan', the flagship programme of the Ministry of Women and Child Development, Government of India, on 8 March, 2018. The "POSHAN Abhiyaan" is a multi-ministerial convergence mission with the goal of making India malnutrition free by 2022. The goal is to reduce stunting in most malnutrition prone districts in India by improving the utilisation of Anganwadi services and enhancing their quality-of-service delivery. Its goal is to guarantee that pregnant women, mothers, and children have a balanced diet with adequate nutrition.

- viii. Supplemental Nutrition Program (SNP): The Integrated Child Development Services (ICDS) system includes six services, one of which is Supplementary Nutrition. The service is available to all children under the age of six, pregnant women, and breastfeeding mothers.
- ix. Integrated Child Development Services Scheme (ICDS): ICDS project has been set-up at the block level for implementation. The goal is to enhance the nutritional and health status of children aged 0 to 6 years. The main objectives of the ICDS scheme are listed below.
- To create the groundwork for a child's optimal psychological, physical and social growth.
 - To minimise mortality, morbidity, hunger and school dropout rates.
 - To ensure effective coordinated policy development and its implementation across all departments in order to promote child development.
 - To improve the mother's ability to take care of her child's normal health and nutritional needs through correct nutrition and health education.

The ICDS Scheme provides a set of six services including nutritional supplements, non-formal education in the pre-school years, education on nutrition and health, immunization, health check-up and referral services. Three of the six services, which are, immunization, health check-up and referral services are related to health and are provided through the National Health Mission and Public Health Infrastructure. The services are offered at Anganwadi Centres through Anganwadi Workers (AWWs) and Anganwadi Helpers (AWHs) at the grassroot level. The present status of Anganwadi Centres in Dhemaji block is given in **Table 11.3**.

Table 11.3: Details of Anganwadi Centres under Dhemaji's Integrated Child Development Scheme (ICDS) Project

No. of AWCs functioning	Total families covered	Number of Beneficiaries				Number of AWCs with drinking water facility	Number of AWCs with toilet
		0.5 to 3 years	3 to 6 years	Pregnant women	Lactating mothers		
538	34,368	6,403	8,446	1,357	1,328	110	63

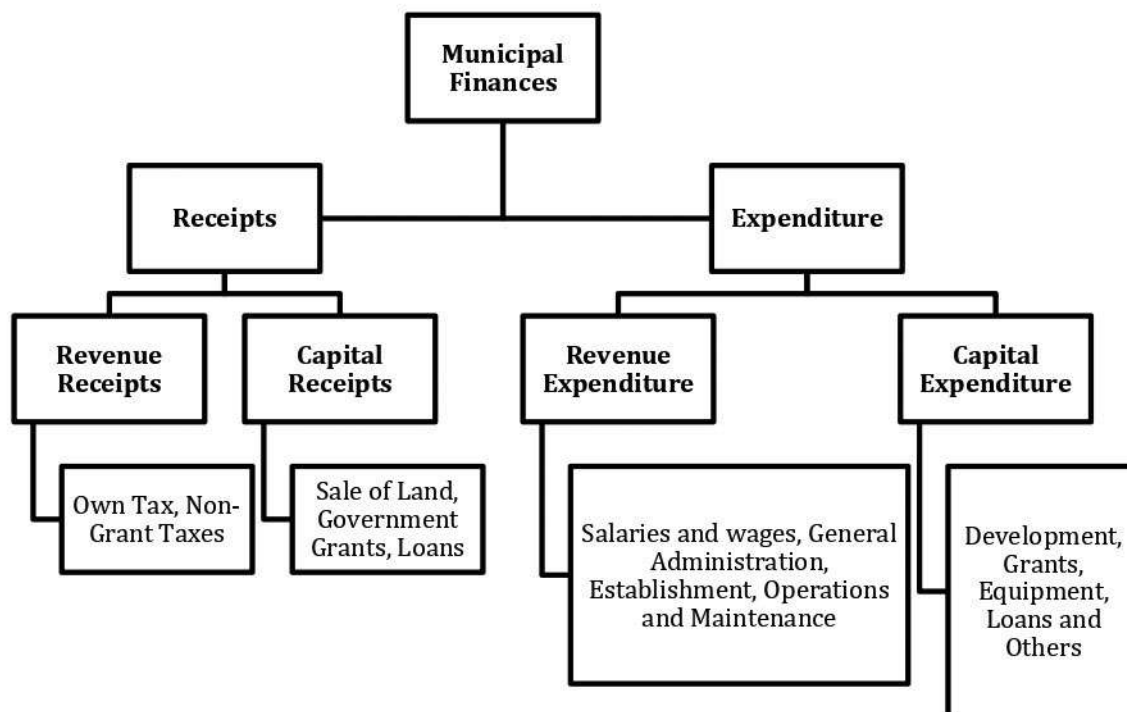
Source: District Social Welfare Department, Dhemaji (2020).

11.4 Municipal Finance

Dhemaji Municipal Board has been assigned a range of functions related to the provision of public services for which they have to manage revenue as well as capital finances. Revenues are raised to cover capital investments and recurrent revenue expenditures. The raised revenues must be utilized to fulfil the needs of the public as well as enhance the development of the town. The present financial position of the Dhemaji Municipal Board is such that it is hardly able to provide quality civic services to the urban dwellers. The ULB struggles with the construction and maintenance of major urban facilities and services, especially on the infrastructure and development fronts.

At present, the revenue of the Dhemaji Municipal Board comprises mainly of its own source taxes and non-taxes along with state government grants. The capital income comprises revenues earned from the sale of land, general grants from state and central governments, and various loans. It is empowered to levy and collect taxes approved by the state government as shown in **Figure 11.2**.

Figure 11.2: Financial Structure of Dhemaji Municipal Board, 2021



Even though the municipal board has maintained a positive surplus in 2020-21, the assessment of this surplus is not a pleasant one. **Table 11.4** shows the breakup of total expenditure and receipts for Dhemaji Municipal Board. It can be seen that the total

revenue receipts increased from 36.26 lakhs in 2016-17, when the town had an addition of 6 new wards, to 92.47 lakhs in 2020-2021, that is, more than 2.5 times increment in 5 years. Despite this, the total expenditure saw a massive dip and decreased by approximately 5 times in the same duration. Amidst all this, one must consider the fact that the number of wards increased from 4 to 10 in 2016 which should have ideally led to an increase in the sources of revenue as well as expenditure. However, only the revenue receipts saw an increment while the expenditures have been declining.

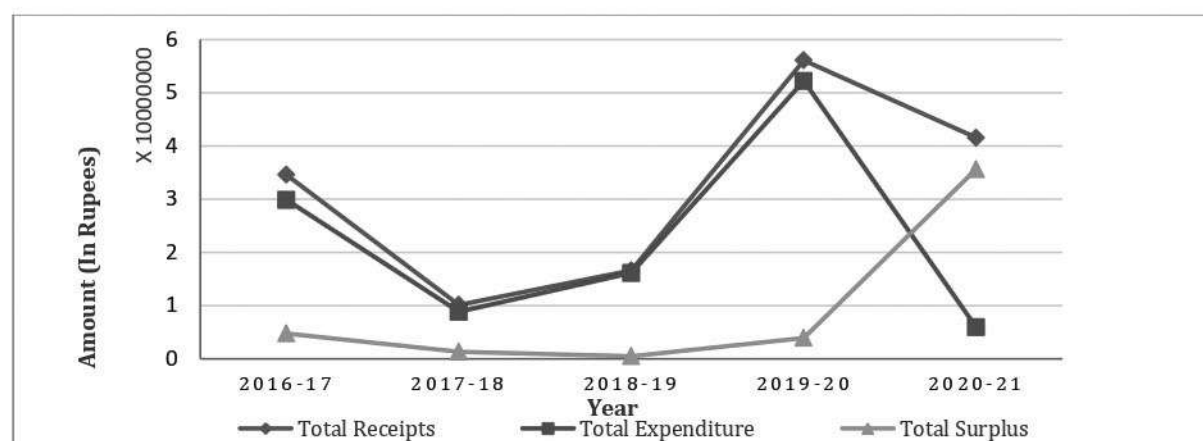
Table 11.4: Total Receipts and Expenditure (in lakhs) of Dhemaji Municipal Board

Particulars	2016-17	2017-18	2018-19	2019-20	2020-21	Average Contribution (percent)
Revenue Receipts	36.26	28.37	128.85	146.62	92.47	28.09
Capital Receipts	306.75	72.21	349.7	409.70	284.00	71.91
Opening Balance	2.88	0.57	2.09	470.62	38.97	3.20
Total Receipts	345.90	101.16	165.92	561.04	415.44	-
Total Expenditure	298.34	88.05	161.21	522.07	58.99	59.96
Total Surplus	47.56	13.11	4.70	38.97	356.44	24.48

Source: Dhemaji Municipal Board (2021).

Figure 11.3 shows the total expenditure, receipts and surplus for Dhemaji Municipal Board from 2016-17 to 2020-21. There has been a sudden dip in both the expenditure and receipts for the year 2020-21 despite having a positive growth in the surplus.

Figure 11.3: Total Receipts, Expenditure and Surplus of Dhemaji Municipal Board



Source: Dhemaji Municipal Board (2021).

Due to the slow pace of urbanization, low population and the maintenance of a constant yearly surplus, Dhemaji Municipal Board has not been able to provide the minimum required civic amenities and infrastructure to the city dwellers. Its performance in the matter of augmenting its own revenue from sources allocated to it has been dismal. Inadequate capacity to utilize funds has prevented it from discharging even its own obligatory functions to the full extent.

The perennial underperformance of the municipal board despite having surplus funds every year points towards a resource crunch which is more in the human resource aspect as compared to the financial aspects. This can be attributed to the ULB being under-staffed with a severe lack of skilled employees. This lack in technical, managerial and administrative competence of the employees has led to a severe decrement in its own revenue generation and fund utilization. This has further resulted in the municipal board's growing dependence on Government Grants.

11.4.1 Receipts Analysis

Receipts can either be in the form of revenue receipts or capital receipts. The main difference between revenue receipts and capital receipts is that in the case of revenue receipts, government is under no future obligation to return the amount, that is, they are non-redeemable. But in case of capital receipts, which are mostly borrowings, government is under the obligation to return the amount along with interest.

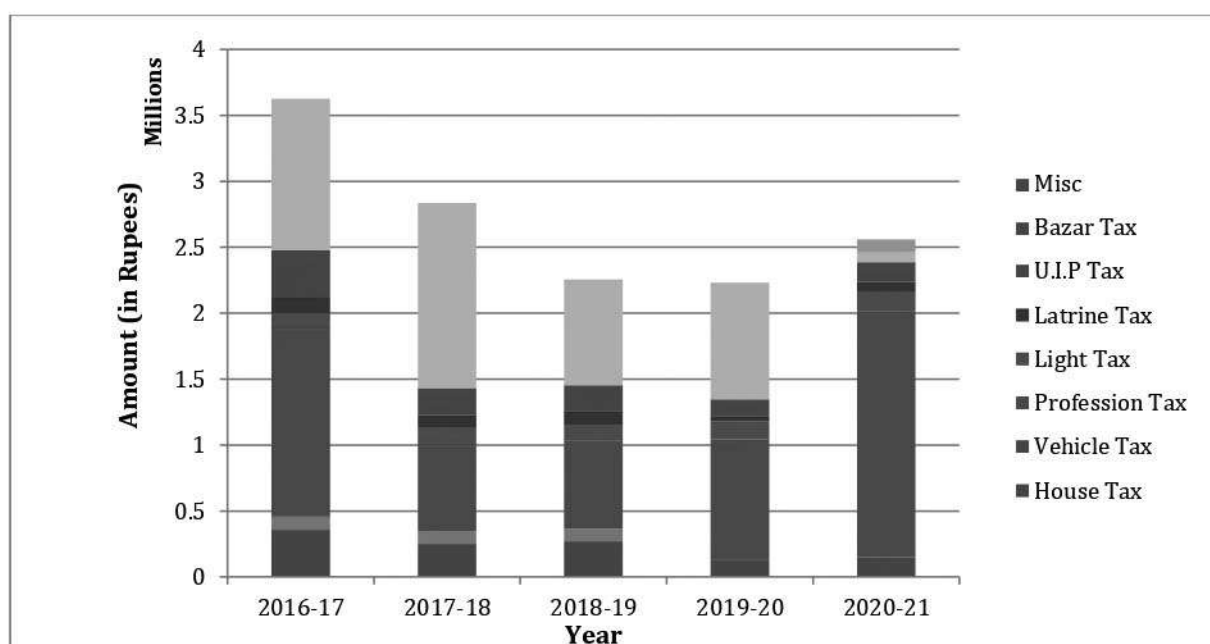
Revenue receipts basically comprise of own tax and non-tax revenues, as well as grants from the state government. The Dhemaji Municipal Board is vested with the power to levy, within the limits of the municipality fees, tolls, and taxes or any of them, under Section 68 of Assam Municipal Act, 1956 as follows:

- A tax on holding situated within the municipality assessed on their annual value, payable by the owner.
- A water tax, payable by the owner or occupier on the annual value of holdings.
- A lighting tax, payable by the owner or occupier on the annual value of holdings.
- A latrine tax, payable by the owner or occupier on the annual value of holdings.
- A drainage tax, payable by the owner or occupier on the annual value of holdings, where a system of drainage has been introduced.
- A tax on private market payable by the owner.

- License fees on carts, carriages, and animals used for riding or burden.
- A fee on the registration of dogs and cattle.
- A fee on boats mooring within the municipality.
- Tolls on bridges.
- A betterment fee on holdings in area of which value has increased due to improvement schemes completed at Board's cost.
- Fees for setting up and maintenance of fire brigade.
- Fees for conducting at the cost of the Board any schemes of social service for the improvement of public health.
- With sanction of Government of Assam any other tax, toll, rate or fee.
- License fee on boats.

Revenue receipts from the municipal board's own sources and their shares are given in **Figure 11.4**. It clearly shows that profession tax and market or bazar tax dominate the revenue receipts. Urban Immovable Property (UIP) tax, light tax and house tax have a moderate contribution as well. It can be observed that bazar tax which contributed more than 30 percent of the revenue for the past five years saw a major dip in the financial year 2020-21. However, profession tax saw a major boost, almost doubling in its revenue contribution. The overall revenue receipts have declined since the financial year 2016-17.

Figure 11.4: Composition of Revenue Receipts of Dhemaji Municipal Board

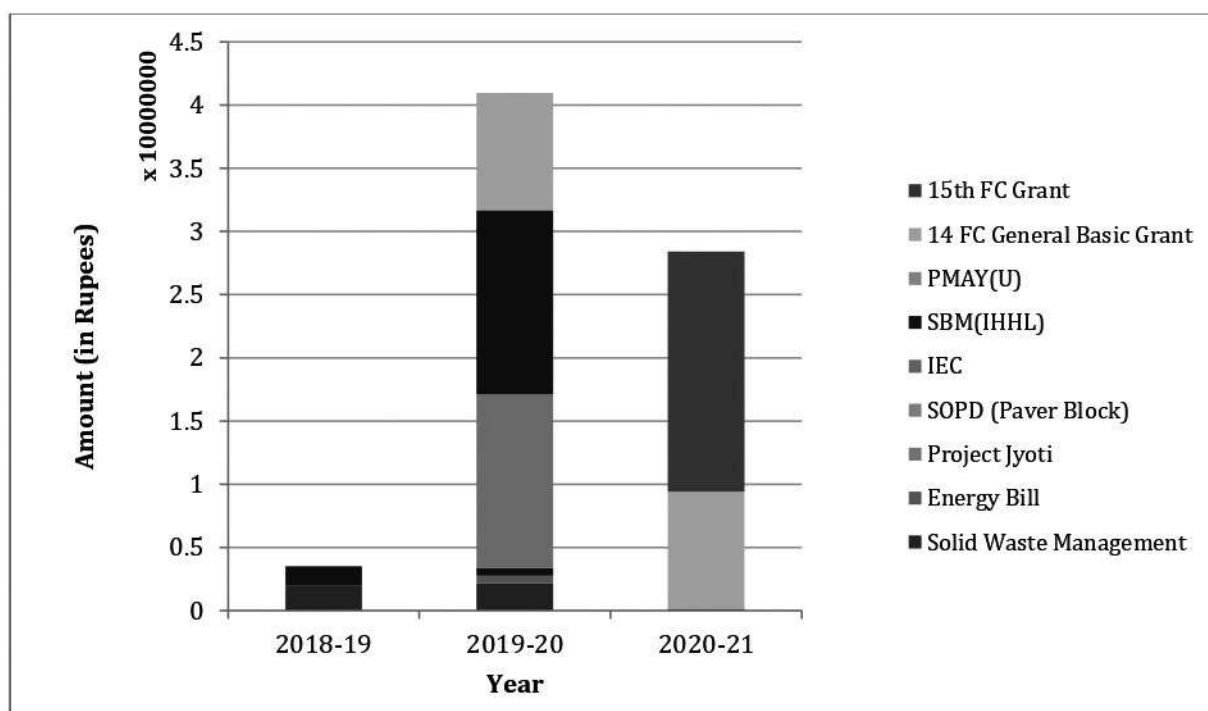


Source: Dhemaji Municipal Board (2021).

Non-tax sources like fees under municipal acts, fines, and other miscellaneous charges have a low contribution to the revenue. State government grants saw a decline in the financial year 2020-21 as shown in **Table 11.2** in section 11.3. Devolution of funds make up the majority share of the state government grants which form a part of the revenue receipts.

Capital receipts for Dhemaji Municipal Board mainly comprise of general grants by the central government. **Figure 11.5** shows the composition of capital receipts for Dhemaji Municipal Board between 2018 and 2021. This figure shows that grant for solid waste management (SWM) show a sharp decline from the year 2018 to 2021 due to the inability of the Municipal Board to operationalize the SWM process. This shows that lack of funds may not be the only reason for the poor development of the town. This further highlights the need for managerial and technical expertise in the administrative setup.

Figure 11.5: Composition of Capital Receipts of Dhemaji Municipal Board



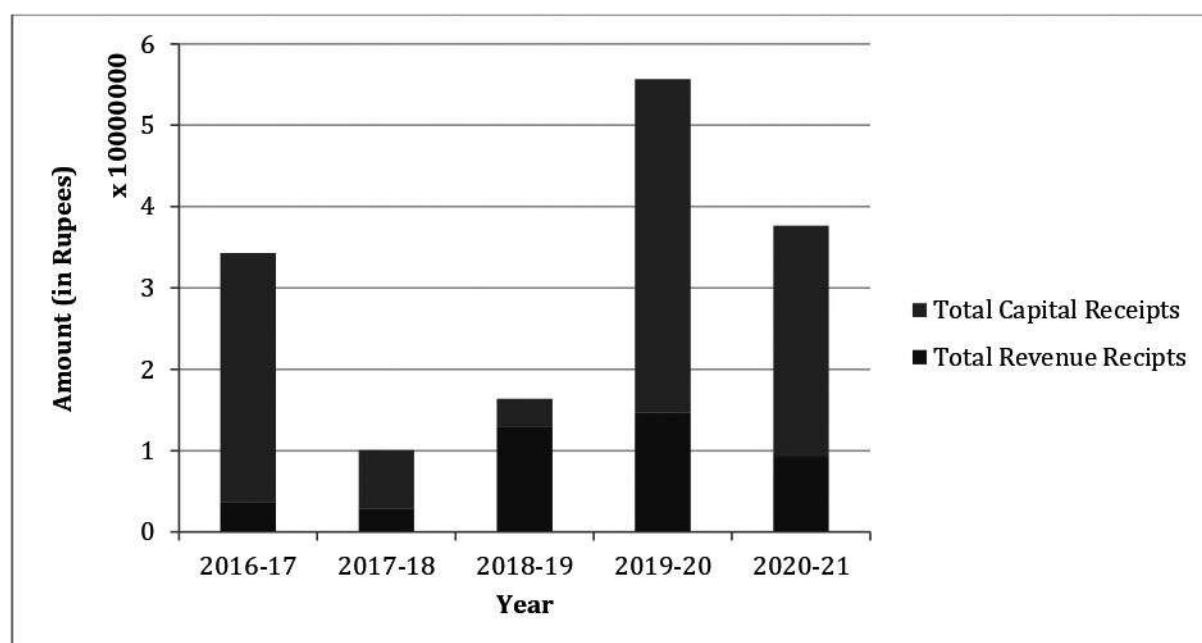
Source: Dhemaji Municipal Board (2021).

The major share in Capital Receipts is that of grant contributions for specific purpose and development. The existing capital receipts consist of funds from various schemes and flagship projects such as Swachh Bharat Mission – Individual Household Latrine Application (SBM-IHHL), Pradhan Mantri Awas Yojana (PMAY-U), 14th and 15th

Finance Commission general basic grant, State Owned Priority Development (SOPD), Information, Education and Communication (IEC), Project Jyoti, etc. In the year 2020-21, major share of the government grant receipts was from the 14th and 15th Finance Grant comprising more than 80 percent of the total share. This fund was majorly utilized for drainage construction in the town.

The capital receipts have dominated the total receipts since the last two years as shown in **Figure 11.6**. Capital receipts witnessed a sudden boost in the financial year 2019-20. Over the past years, it can be seen that capital grants have been at least twice as much as the revenue income except for the years 2018-19 where revenue receipts were nearly 4 times the capital receipts.

Figure 11.6: Revenue Receipts vs. Capital Receipts, 2016-2020



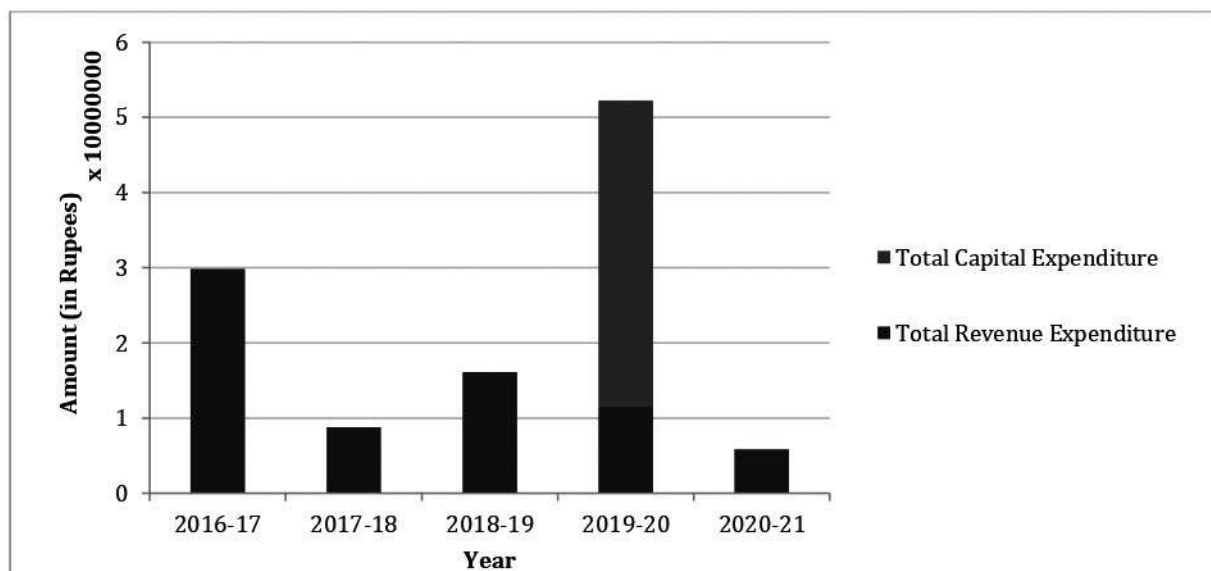
Source: Dhemaji Municipal Board (2021).

11.4.2 Expenditure Analysis

In the case of expenditure, revenue expenditures share the major portion with exception of 2019-20 when capital expenditure was more than 50 percent of total expenditure. **Figure 11.7** shows the year-wise share of revenue and capital receipts. However, from 2016 to 2018, the break-up of grant expenditure was unavailable, and has therefore been excluded from the assessment.

Revenue expenditure in Dhemaji mainly comprises of expenditure on general administration, contingencies, collection of taxes, salaries and wages, establishment, operation and maintenance, and construction of roads, etc. The highest share in revenue expenditure is for the construction of roads, culvert and community infrastructure, which takes up nearly 45.54 percent of the total revenue expenditure. This is followed by expenditure on General Administration which takes up nearly 22.73 percent of the total revenue expenditure. Collection of taxes takes up nearly 14.35 percent of the total revenue expenditure. **Table 11.5** shows the composition of revenue expenditure from the financial year 2016-17 to financial year 2020-21.

Figure 11.7: Share of Capital and Revenue Expenditure of Dhemaji Municipal Board, 2016-2020



Source: Dhemaji Municipal Board (2021).

Table 11.5: Composition of Revenue Expenditure of Dhemaji Municipal Board

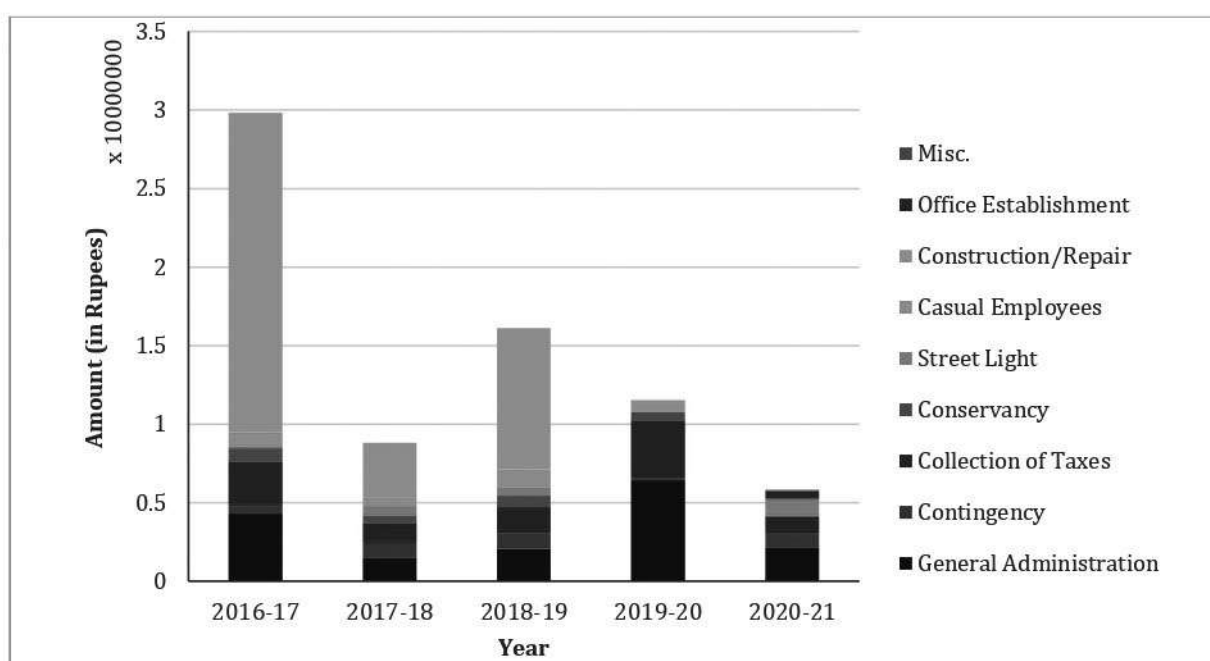
Items	Amount (in Lakhs)					Average (percent)
	2016-17	2017-18	2018-19	2019-20	2020-21	
General Administration	43.04	14.66	20.63	64.30	21.25	22.73
Contingency	5.99	9.80	9.86	1.67	9.58	5.12
Collection of Taxes	27.18	12.76	16.72	36.42	10.40	14.35
Conservancy	8.36	4.85	7.37	5.49	0.80	3.73
Streetlight	1.50	5.96	5.00	0	10.40	3.17
Casual Employees	8.75	5.00	11.67	7.46	0	4.56
Const. of road, culvert, Community Hall, Garbage Disposal	203.48	35.00	89.94	0	0	45.54
Office Establishment	0	0	0	0	4.82	0.67

Miscellaneous	0	0	0	0	0.92	0.13
Total Revenue Expenditure	298.34	88.05	161.21	115.36	58.19	100

Source: Dhemaji Municipal Board (2021).

As evident from **Figure 11.8**, a significant share of the revenue has been spent on general administration in the past 5 years. Also, while the average percent expenditure on construction of infrastructure accounts for the maximum expenditure, it has seen a major decline in the past two years. This shows that Dhemaji Municipal Board has massively reduced its expenditure on the construction of roads, culverts, community halls, etc., even when the conditions of the existing infrastructure in the town need immediate improvement.

Figure 11.8: Composition of Revenue Expenditure of Dhemaji Municipal Board

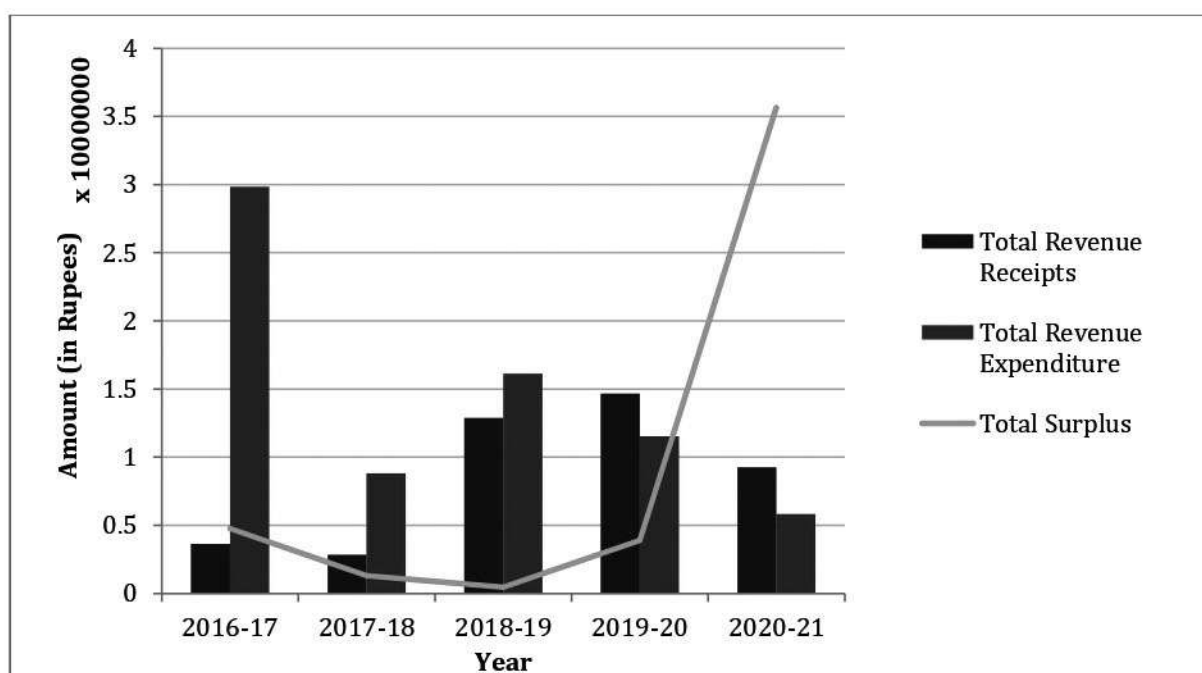


Source: Dhemaji Municipal Board (2021).

Expenditure on the collection of taxes and administration has taken up a major portion of the revenue expenses. Expenditure on the installation of streetlights has increased in the financial year 2020-21. While analysing the revenue receipts versus revenue expenditure, as shown in **Figure 11.9**, the revenue expenditure has not only declined in the last two years but has also been less than the revenue receipts for these years. This has been leading to a steep rise in the creation of surplus utilized funds with the municipal board.

The year 2020-21 received a large portion of government grants for which the expenditure was low. This has also led to a huge surplus being created with the municipal board, which can be utilized after careful analysis for the future development of the town. For the financial year 2020-21, the DMB capital grants of nearly 2.8 crores, out of which only 8 lakhs were spent on the Energy Bill. The rest of the major capital receipts of nearly 2.8 crores from the 14th and 15th FC grants, funds for solid waste management, and IEC remained completely unutilized.

Figure 11.9: Revenue Receipt versus Revenue Expenditure, 2016-2020



Source: Dhemaji Municipal Board (2021).

11.5 Conclusions

Overall, in the ULB, there appears to be a lack of experience in handling big infrastructure projects. Data management and availability are one of the major issues in the ULB leading to improper records, lack of analytically sound decision-making, and administrative negligence. For the yearly capital and revenue financial records, there is a need to provide suitable training on the double-entry accounting or accrual system of accounting. Loopholes in the maintenance of detailed financial records have led to severe inefficiency in the revenue collection system. The asset management and maintenance are also inadequate. There is considerable room for review and revision of the current tax rates. Dhemaji Municipal Board also lacks a proper information system

and mechanism for updating the registry of land and properties. The municipality has vacant properties which break the continuous process of valuation and collection. Also, there is lack of manpower to conduct all of its administrative processes. The database and information management are poor and still reliant on obsolete methods of record keeping. There is a lack of use of technology in infrastructure monitoring, which can provide faster, more accurate, and easy to maintain records. To achieve this, more technically skilled human resource needs to be placed in the ULB, and skill development training needs to be provided for the existing staff.

Looking at taxation, the property tax collected by the Dhemaji Municipal Board is not enough to yield adequate revenue for meeting the local needs and demands of the city. The tax collection efficiency in Dhemaji is low, which might be a result of failure to revise the tax base from time to time. The data collected from the primary and secondary surveys reflects lesser tax collection as compared to the other sources of revenue income like government grants.

The governance and financial institutions of the town seem to have a definite scope for development as their tasks and responsibilities are increasing manifold due to their expanded jurisdiction since 2016. Also, proper utilization and management of existing human as well as financial resources can provide a platform for much more efficient and holistic growth. The institutional framework of the local governance in Dhemaji, therefore, needs overall improvement as it can play a dynamic role in the overall development of the area. The increase in the collection of the board's own revenue is indicative of its growth and stability. In fact, growth of the own revenue depends solely on well-functioning and good service delivery of the board. It would be pertinent to examine the extent of movement of own tax and non-tax collection by the Dhemaji Municipal Board over time for analytically sound and successful decision-making.

CHAPTER 12: LAND USE

12.1 Introduction

The competition among various land uses is intense in urban areas. Therefore, it becomes necessary to analyse the existing land use pattern so that future development plans and policies are formulated after giving due importance to each of these land uses.

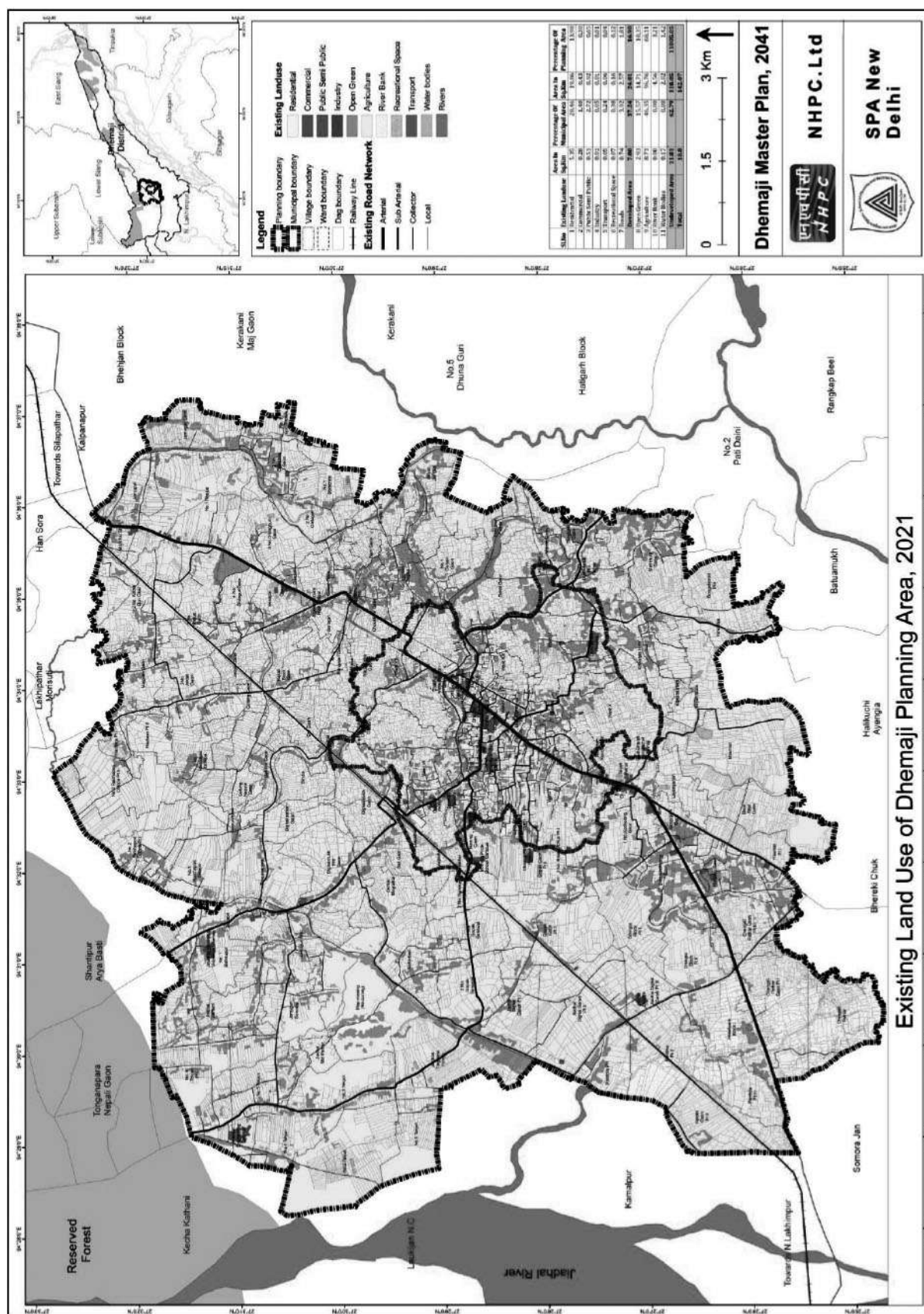
A detailed land use survey was conducted in the Dhemaji Municipal Area by the SPA Delhi team from 24 to 26 October 2021 to understand the existing land use pattern. The survey helped in identifying the town's residential, commercial, institutional, and industrial pockets, as well as key landmarks such as educational, healthcare, recreational, public, and semi-public institutions. For this, the municipal area was divided into specific zones and each surveyor was allotted one of these zones to demarcate the land uses spatially. The land use survey, hence, has been considered as the reference point for preparing the existing land use map. Apart from this, satellite imagery for the year 2021 has also been referred in case of any discrepancies or gaps.

12.2 Land Utilization

Land use indicates the purpose for which a piece of land is utilised by means of its allocation, development, and management. The primary land uses considered for the preparation of a master plan include residential, commercial, industrial, public and semi-public, transport and recreational.

For Dhemaji Master Plan 2041, the total planning area comes out to be 142.07 sq km of which 18.80 sq km falls under the municipal area. This implies that municipal area constitutes 13.23 percent of the total planning area. To analyse the land-use pattern, firstly, it is necessary to identify the percentage of developed and undeveloped land. Developed land refers to built-up area which includes land under residential, commercial, industrial, public and recreational land uses as well as the land devoted to transport, utilities and other services. Undeveloped land, on the other hand, includes agriculture, open spaces, vacant land, etc. which is not covered under built-up (see **Figure 12.1**).

Figure 12.1: Land Use for Dhemaji Planning Area, 2021



Source: SPA Delhi (2022).

Within the Dhemaji Municipal Area, developed land accounts for 37.23 percent of the town's area and in the Dhemaji Planning Area, developed land constitutes 16.90 percent of the total area as shown in Table 12.1.

Table 12.1: Share of Developed and Undeveloped Land in Dhemaji Planning Area, 2021

Type of land	Municipal Area		Planning Area	
	Area (sq km)	Percent	Area (sq km)	Percent
Developed land (built-up area)	7.00	37.23	24.01	16.90
Undeveloped land (Non built-up area)	11.80	62.76	118.05	83.09
Total area	18.80	100	142.07	100

Source: Primary Survey, SPA Delhi (2021).

Further, Table 12.2 shows the share of different land uses in the municipal as well as planning area. It can be seen that agriculture is the predominant land use followed by residential and transportation, respectively. This holds true for both the municipal and the planning area as shown in Table 12.2.

Table 12.2: Share of different land uses in Dhemaji Municipal Area and Dhemaji Planning Area, 2021

Type of land use	Municipal Area			Planning Area	
	Area (sq km)	Percent (of total area)	Percent (of developed land)	Area (sq km)	Percent (of total area)
Residential	5.34	28.40	76.28	19.85	13.97
Commercial	0.27	1.43	3.85	0.43	0.30
Industrial	0.01	0.05	0.14	0.01	0.007
Public and Semi-public	0.51	2.71	7.28	0.91	0.64
Transportation	0.78	4.14	11.14	2.64	1.85
Recreational space	0.07	0.37	1	0.16	0.11
Agriculture	8.71	46.32	-	96.75	68.19
Water bodies	0.16	0.85	-	2.03	0.01
Riverbank	-	-	-	4.55	3.20
Open Spaces/Vacant land	2.92	15.53	-	14.70	10.34

Source: Primary Survey, SPA Delhi (2021).

However, when expressed as a share of the developed land, residential accounts for 47.3 percent, commercial land use is 5.04 percent, industrial land use is 0.16 percent, public and semi-public is 6.8 percent, transportation is 21.6 percent and parks and playgrounds constitute 1.5 percent.

12.3 Residential Land Use

Residential land use includes the areas allotted primarily for housing purpose. This encompasses unplanned and informal settlements as well. In Dhemaji, residential areas are evenly distributed all over the town. Most of the residential land in the core town has single or double storeyed buildings. The residential land is mixed with commercial and public use, particularly along the main roads, where one can find triple storeyed buildings as well. Bamboo structures are more common in the newly added, outer wards and rural areas. During the primary survey, it was observed that houses in the outskirts of the town are larger in size than those in the city-centre. Also, in the outer wards, the settlement pattern is linear along roads with houses having bamboo and paddy cultivation in the backside.

In the municipal area, the percentage of residential land use to the total developed land is 76.28 percent. As per URDPFI, residential land use in Dhemaji town, which falls in the category of 'small' town, should be between 45 percent and 50 percent. For the planning area, the share of residential land use is 13.97 percent of the total planning area.

12.4 Commercial Land Use

Commercial use refers to the land which is utilized primarily for businesses and retail. Hence, all profit generating enterprises fall under the commercial land use. This includes retail outlets, wholesale businesses, warehousing, regulated markets, service units and informal markets.

Though Dhemaji Planning Area does not have any significant large scale commercial establishment, within the town, people are engaged in small businesses such as retail of eatables, grocery, plastic products, clothes, stationery, mobile repair, automobile repair, etc. Most of these commercial establishments are located in the centre of the town with higher concentration at certain nodal intersections along NH15, Station road, PNGB road and Civil Hospital road. These include a number of hotels and restaurants as well.

In the Dhemaji town area, land under commercial use is 3.85 percent of the total developed area. However, overall, for the planning area, the land under commercial use is 0.3 percent of the total area. As per URDPFI, commercial land use in Dhemaji town should be between 2 percent to 3 percent.

12.5 Industrial Land Use

Industrial land use includes all economic activities associated with the processing and manufacturing of goods. Though there aren't any large-scale industries in Dhemaji Planning Area, some small scale manufacturing units for handloom and textile, plastic dolls, food and beverage, wooden furniture, bamboo products, etc. are present. Because of the extensive cultivation of paddy in the region, a significant number of rice mills and rice sellers are also operational. At present, 0.14 percent of the total developed area of the town falls under industrial land use. Overall, in the planning area, industrial land use constitutes 0.007 percent. However, as per URDPFI, industrial land use in Dhemaji town should be between 8 percent to 10 percent.

12.6 Public and Semi-Public Use

Public and semi-public use includes all administrative, educational, religious, medical, cultural, utility and service installations. Since Dhemaji town serves as the district's headquarter, all the district-level government departments are situated here, thereby occupying a significant share under public and semi-public land use. Apart from this, there are 28 schools and colleges, which includes SFS School, Felicity Modern School, Dhemaji Town School, Dhemaji Engineering College, etc. and three major hospitals, that is, Civil Hospital, BCB Nursing Home and Mili Nursing Home, in the town area. There are a total of 20 banks as well, including both public and private banks, catering to the financial needs of residents. Most of these public and semi-public areas are located along the main roads. Overall, in the town, 7.28 percent of the total developed area comes under public and semi-public land use. For the planning area, the share of public and semi-public land use comes out as 0.64 percent. As per URDPFI, public and semi-public land use in Dhemaji town should be between 6 percent and 8 percent.

12.7 Recreational Space

Parks and playgrounds play a crucial role in improving physical and mental wellbeing, making them a cornerstone for a good quality of life. Parks and playgrounds in the town

are limited in number, the major ones being Dhemaji Children's Park and Court Field. In the absence of such spaces, the scope of active recreation in the town is rather limited. Parks and playgrounds constitute 1 percent of the town's developed area and 0.01 percent of the total planning area.

12.8 Transportation

Transportation includes all roads, railways, airports, bus stations and truck terminals. The percentage of land use under transportation is 11.14 percent in the town and 1.85 percent in the planning area, when expressed as a share of the developed land. The issue of traffic congestion does exist along NH15 and Station road due to the concentration of market areas along these roads. Transportation constitutes 11.4 percent of the total developed area in the town and 1.85 percent of the planning area. As per URDPFI, land use under transportation in Dhemaji town should be between 10 percent and 12 percent.

12.9 Agriculture

Since Dhemaji has an agrarian economy, a significant portion of the land falls under agriculture, particularly in the planning area. Agricultural land aids in reducing the impact of natural disasters, curbing air pollution and most importantly, ensuring food security. In the municipal area, agricultural land is present in certain pockets in the outer wards and constitutes 46.32 percent of the total area. However, within the planning area, where farming is the predominant activity, 68.19 percent of land falls under agriculture.

12.10 Water bodies

Apart from serving as potential sources of water supply, water bodies help in preventing heat island effect, thereby improving the micro-climate of urban areas. Dhemaji Planning Area has a good number of rivulets, beels and marshes. Jiadhal is the major river flowing close to the planning boundary and its sub-tributaries such as Aradhal, Telijan, etc. flow through the town. However, most of these rivers are seasonal and carry water only during monsoon. Within the municipal area, land under water bodies accounts for 0.85 percent of the total area, while in the planning area, water bodies constitute 2.03 percent of land.

CHAPTER 13: ISSUES AND CHALLENGES

13.1 Demography

Decadal population growth rate of Dhemaji Planning Area has decreased significantly from 52.14 percent in 2001 to 15.11 percent in 2011 which is indicative of the massive out-migration caused due to lack of employment opportunities in this area. Unemployment is a major issue in Dhemaji which can be solved by further promoting and developing industrial and commercial establishments in the region.

Sex ratio in Dhemaji has improved, particularly in the urban area, from 717 in 1991 to 967 in 2011, which is reflective of an increase in the number of female births; a positive societal change. Literacy rate has also gone up from 63.19 percent in 1991 to 85.76 percent in 2011. In fact, percent increase for female literacy rate has been much more than that for male literacy rate in both urban and rural areas.

Workforce participation has also shown a positive trend, particularly from 2001 to 2011, whereby the workforce participation rate increased from 37.94 percent to 46.24 percent. As per Census of India 2011, more than 55 percent of the workers are cultivators which imply that most of the workers in the area are engaged in primary activities. Percent of cultivators has also increased from 2001 to 2011, indicating deepening trend towards agrarian nature of the economy.

13.2 Economy

Economy of Dhemaji is generally agro based. Sericulture, fishing and driftwood business are practiced at a smaller scale. However, sand deposition and other adverse effects of chronic floods on fertile agricultural land have made even the affluent farmers landless. Dearth of any major industry is responsible for multiplying the problem of unemployment within the town and surrounding villages. Some of the small-scale units are registered as weaving or handloom and bamboo industries, however the actual production does not have any market value due to competition from highly finished machine goods that are cheap and maintenance free. The silk industry has the potential to be commercially tapped. Some local people of the area also produce mustard, but they are not able to compete with the non-native businessmen who control the market.

Local economy is thus characterized by subsistence level of production and consumption.

13.3 Housing

Since Dhemaji is prone to floods and earthquakes, building techniques that have proven to be disaster-resistant are used here. Due to the cheap availability of raw materials, the natives of Dhemaji have traditionally lived in individual dwellings made of bamboo and wood. However, due to population expansion and space constraints, RCC buildings and multi-storied structures have grown in the last decade. Many of these structures are not built to withstand earthquakes.

Over 9 percent of houses in the planning area are dilapidated and need to be renovated to improve their condition. Temporary structures account for 26.8 percent of the total housing. These structures are worst affected at the time of floods and therefore, need to be retrofitted to make them adapt better to natural calamities. The demand and supply of housing needs to be analysed to further aid in determining the town's housing shortage.

13.4 Traffic and Transportation

NH15 passes through Dhemaji town, connecting it to the nearby towns of Bordoloni, Gogamukh, Silapathar and Jonai. It serves as a lifeline for Dhemaji by facilitating transit connectivity. It is the sole way to get to Arunachal Pradesh and acts as a vital link for the movement of people and goods in and around the planning area. NH15 runs through the town's centre in an east-west direction. Converting NH15 into a two-lane road with adjacent footpaths and underground pucca drains is required.

The traffic problem in Dhemaji is not due to the high growth of the fast-moving vehicles but because of the unplanned road network, centrally located bus-terminal, insufficient parking space, narrow roads, defective road termination and non-maintenance of roads. These issues need to be tackled comprehensively. Traffic congestion worsens during the monsoon season at the time of heavy rains when most of the local roads are water-logged.

13.5 Water Supply and Drainage

Groundwater is the principal source of water in the Dhemaji Planning Area. The municipality has not implemented piped water supply scheme within the town. So, ground water is retrieved at the household level through wells, handpumps, tube wells, tanks, and other means. The chemical quality of Dhemaji's ground water is not as per the required standards. A high quantity of some dangerous elements, including iron and arsenic, has been found which exceed the permissible limit set by BIS and WHO.

Because of the existing hydrogeological setup and the abundance of ground water resources, there is a lot of room for ground water development by building ground water abstraction facilities. In the near future, tube wells or filter point wells could also be used. Iron treatment plants and water supply stations by the Public Health and Engineering Department (PHED) must be established as soon as possible for drinking purposes. The presence of arsenic in shallow ground water necessitates immediate investigation, and based on the findings, water from very deep aquifers should only be distributed. A large number of tube wells under the Public Health and Engineering Department are currently inactive or have very low discharge. Rehabilitation of these wells is to be carried out so as to mitigate water scarcity.

The drainage system of Dhemaji is inadequate, resulting in regular flooding of highways and streets during the rainy season. The drains are not well connected or continuous which often leads to water logging within the town. So, construction and repair of stormwater drainage system must be prioritised. Since the town is prone to flooding, construction of drains along the natural drainage network would be preferable.

13.6 Solid Waste Management

Solid waste management system is highly inadequate and disorganized in Dhemaji town. Only one dump site exists, and efforts are being made to make the second dump site operational. Recycling or reuse of wastes is not being done adequately at the town level and no centralized compost plant is operational at present. To tackle the problem of solid waste management and to promote cleanliness in the town, Dhemaji Municipal Board needs to set up a greater number of community bins in the area. Door to door collection of waste must be facilitated for which more pick-up vehicles would be required. Preventive, maintenance and monitoring measures must be implemented to

ensure adequate collection, transportation and disposal of solid waste. For biomedical and hazardous waste, source segregation becomes really important.

A new disposal site needs to be developed and operated following the guidelines provided under the MSW Rules, 2016 issued by the Ministry of Environment, Forests and Climate Change (MOEFCC). So far, no studies have been carried out to determine the effect of waste disposal operations on the surrounding environment in Dhemaji town.

13.7 Sanitation

Access to basic sanitation is a critical concern in the Dhemaji Planning Area. Due to the absence of sewerage system at the town level, most households have installed private latrines in the form of flush or pit latrines in their homes. According to Census of India 2011, 7.7 percent of urban households and 49.7 percent of rural households do not have a latrine. Also, 92.1 percent of households discharge wastewater in the open, posing a major health risk.

Individual household latrines were built in villages under the Swachh Bharat Mission to give access to sanitation and eliminate open defecation. However, during the primary survey we found that some families in rural areas believe that a pucca latrine might dirty their environment. Such beliefs are reflective of the economic and cultural reasons that explain the prevalence of open defecation in Dhemaji. Many households in rural areas are economically poor and have kuccha latrines or temporary toilets that get washed away during the flood season. Although sanitation coverage under the Swachh Bharat Mission in Dhemaji is noteworthy but until effective steps are uniformly implemented in the planning area, it would be difficult to curtail the menace of open defecation.

13.8 Social Infrastructure

There are 28 schools and colleges in Dhemaji town which serve a population of 29,931. Of these, primary and secondary schools in the town are more than the required number, whereas secondary and senior secondary schools are fewer. The town's primary medical institution is Dhemaji Civil Hospital. Apart from this, the town centre has two nursing homes. Although there are enough healthcare facilities to support the

town's population, the quality of their services is subpar. Majority of hotels and restaurants are located along the main routes, that is, NH15 and Station Road. The recreational facilities in the town, particularly with respect to tourism, have immense scope for development. More number of public parks must be developed where residents can spend their leisure time. Within the town area, there are three market complexes. However, these market facilities lack adequate maintenance and are in a dilapidated state. All communal gatherings and religious ceremonies in Dhemaji are usually held in *Naamghars*.

13.9 Environment and Natural Disasters

Dhemaji has abundant water resources and a complex geomorphology. Its environment is prone to damage, particularly in areas vulnerable to several natural hazards. High iron and arsenic content in drinking water sources remains a major concern. Therefore, the presence of harmful elements in shallow ground water must be carefully assessed and water from deep aquifers alone should be provided for drinking purpose. With an even distribution of small water bodies throughout the urban area, Dhemaji has huge potential for developing its water resources. But above observations suggest that these water bodies require proper maintenance and quality checks.

Floods and erosion are the major natural hazards that need to be dealt with. Loss of life, property, livestock and croplands because of floods is still a serious issue. The area lies in high seismic risk zone making it vulnerable to earthquakes. Therefore, the Master Plan could consider making careful consideration for disaster mitigation strategies with adequate provisions for relief shelters, damage prevention and rescue plans.

13.10 Governance and Finance

Overall, in the ULB, there appears to be a lack of experience in handling big infrastructure projects. Data management and availability are one of the major issues in the ULB leading to improper records, lack of analytically sound decision-making, and administrative negligence. For the yearly capital and revenue financial records, there is a need to provide suitable training on the double-entry accounting or accrual system of accounting. Loopholes in the maintenance of detailed financial records have led to severe inefficiency in the revenue collection system. The asset management and maintenance are also inadequate. There is considerable room for review and revision of

the current tax rates. Dhemaji Municipal Board also lacks a proper information system and mechanism for updating the registry of land and properties. The municipality has vacant properties which break the continuous process of valuation and collection. Also, there is lack of manpower to conduct all of its administrative processes. The database and information management are poor and still reliant on obsolete methods of record keeping. There is a lack of use of technology in infrastructure monitoring, which can provide faster, more accurate, and easy to maintain records. To achieve this, more technically skilled human resource needs to be placed in the ULB, and skill development training needs to be provided for the existing staff.

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The governance and financial institutions of the town seem to have a definite scope for development as their tasks and responsibilities are increasing manifold due to their expanded jurisdiction since 2016. Also, proper utilization and management of existing human as well as financial resources can provide a platform for much more efficient and holistic growth. The institutional framework of the local governance in Dhemaji, therefore, needs improvement as it can play a dynamic role in the overall development of the area. The increase in the collection of the board's own revenue is indicative of its growth and stability. In fact, growth of the own revenue depends solely on well-functioning and good service delivery of the board. It would be pertinent to examine the extent of movement of own tax and non-tax collection by the Dhemaji Municipal Board over time for analytically sound and successful decision-making.

13.11 Conclusions

Rent infrastructural developments, which include Bogibeel bridge, Dhemaji Engineering College and Dhemaji Law College, have enhanced the scope and potential for future growth in Dhemaji, particularly within the town, and this must be taken into consideration while estimating the projected population for the year 2041. Bogibeel

bridge has increased the accessibility of the town from the nearby urban centres situated in Upper Assam and Arunachal Pradesh. With an upcoming Medical College, Dhemaji is being envisioned to serve as an educational hub in the near future.

However, growth in terms of physical infrastructure has been minimal. There's a dire need to come up with a piped water supply scheme and a sewerage network at the town level. Also, adequate measures to improve the stormwater drainage network and solid waste management system need to be taken.

On these bases, the planning and development proposals for Dhemaji Master Plan 2041 should be formulated with a vision to accelerate economic growth and infrastructural development in the area. The aim would be to provide basic facilities in terms of physical and social infrastructure and to generate adequate employment opportunities with the following objectives:

- To evaluate the housing demand and make adequate provisions to meet the housing requirement.
- To propose piped water supply system, particularly within the town area, through adequate extraction, treatment and distribution of surface water and ground water.
- To design sewerage network for the town which would require the provision of a Sewerage Treatment Plant (STP) of the required capacity. In the initial phase, Faecal Sludge Treatment Plant (FSTP) can be proposed.
- To allocate space for a Waste Management Site for adequate treatment and disposal of all types of wastes.
- To improve the stormwater drainage system to curb the problem of flooding.
- To propose social infrastructure facilities in the form of schools, colleges, university and hospitals as required for the projected population.
- To plan out a network for roads, particularly, sub-arterial and collector roads, in order to minimise the volume of traffic on NH15 and Station road.
- To identify pockets for industrial establishments, preferably away from the town.
- To utilise the immense potential of sericulture and handloom in the area.

PLANNING AND DEVELOPMENT PROPOSALS

CHAPTER 14: POPULATION PROJECTION

14.1 Introduction

Population projection is used to estimate the number of people expected to reside in an area during the planning time horizon. There are certain mathematical and analytical methods used for projecting population such as arithmetic projection, geometric projection, incremental increase method, etc.

Arithmetic projection, for instance, assumes a constant numerical population change every year and geometric projection, on the other hand, proposes percent changes instead of numerical changes. So, for a rapidly developing city, arithmetic projection is likely to underestimate population growth and hence, is not used often in planning. Hence, it becomes crucial that the method for population projections is selected suitable to a context in order to avoid chances of overestimation or underestimation.

However, changes in population are dependent on various social and economic factors. This implies that the type of method to be used for estimating the projected population would be based on the analysis of the existing scenario and the pace at which the area is likely to develop. Analysis of Dhemaji town is presented in the preceding part of this report.

14.2 Population Projection

As per Census 2011, the population of Dhemaji Planning Area is 77,791, of which 47,860 is the rural population and 29,931 is the urban population. The growth rate for Dhemaji Planning Area has declined significantly from 37.67 percent in 1991-2001 to 16.18 percent in 2001-11, as discussed in section 2.2 of this report. However, it is expected that because of the proposed development being induced through this Master Plan, the growth rate is expected to increase in the coming decades. Based on this, taking an average growth rate of 20 percent for rural areas and 25 percent for urban area, the projected population of the Planning Area is projected which comes out as 1,45,000 as shown in **Table 14.1**. Of this, 85,000 is the projected rural population and 60,000 is the projected urban population.

Table 14.1: Population Projection for Dhemaji Planning Area, 2041

Year	Rural	Urban	Total
2011	47,860	29,931	77,791
2021	59,078	37,713	96,791
2031	70,893	47,518	118,411
2041	85,071	59,873	144,944

14.3 Rural-Urban Scenario

The projected population figures depict that by 2041, 58 percent of the population would reside in rural areas while 42 percent would be living within the town, indicating that the proposed development would aim to give a push to urbanisation in the Planning Area. This further implies that while maintaining the rural character of Dhemaji, infrastructural proposals in the form of industries, commercial centres, educational institutions, and healthcare facilities would promote economic growth, thereby increasing the share of population in the urban area.

The projected population would form the basis for estimating the capacity and area for the proposed facilities and amenities.

CHAPTER 15: HOUSING

15.1 Introduction

Before formulating the proposals for housing, it is necessary to assess the existing housing stock and only then calculate the housing need as well as housing gap or shortage. Here, housing need refers to the number of houses required depending on the household size and population growth. Housing shortage, on the other hand, refers to a deficiency or lack in the number of houses needed to accommodate the projected population of an area. Based on the housing required for the projected population, area for residential land use shall be proposed.

15.2 Housing Requirement Assessment

Housing requirement is assessed on the basis of the projected population. Assuming that the household size will decrease over time as people would prefer to stay in a nuclear family set-up; housing need is calculated using the formula,

$$\text{Housing Need} = \frac{\text{Population}}{\text{Household Size}}$$

Housing stock refers to the total number of houses present within the town. It is assumed that one household is equals to one house. So, in Dhemaji planning area, the existing housing stock for the year 2011 is 16,697 houses which comprise of 3,047 houses that are either congested or obsolete or both (refer section 4 for further details). So, effectively only **13,650** habitable **housing stocks are available** in Dhemaji planning area.

Housing gap for subsequent years is estimated to be 7,623, 12,959, and 19,671 for the year 2021, 2031 and 2041 respectively. Master of Dhemaji suggests an additional supply of nearly 19,700 houses by 2041. Nearly 12,000 housing stocks are planned to be available by 2031 in the first phase and the remaining housing stocks i.e 7,700 will be constructed in next phase refer **Table 15.1**.

Table 15.1: Housing Assessment for Dhemaji Planning Area, 2041

Aspects	2011	2021	2031	2041
Population	77,791	96,791	1,18,411	1,44,944
Household Size	4.7	4.6	4.5	4.4
Housing Need	16,697	21,273	26,609	33,320
Available Housing Stock	13,650	13,650	13,650	13,650
Housing Gap	3,047	7,623	12,959	19,671
Housing Supply	-	-	12,000	19,700

Source: Estimated based on Census of India (2011)

15.3 Plotted Development

Since developed land accounts for only 37 percent of the total municipal area, there is enough space for future housing to come up. Therefore, instead of group housing, reasonably large residential plot sizes are proposed for all families of different economic classes as shown in Table 15.2. Hence, plotted housing will continue to be the dominant housing typology in the planning area. It is further assumed that 30 percent population in Dhemaji town belongs to the Economically Weaker Section, 25 percent population belongs to the Low Income Group, 20 percent to Middle Income Group-I, 10 percent to Middle Income Group-II, 10 percent to High Income Group-I and 5 percent to High Income Group-II.

Spatial allocation of land for housing or residential land use seeks to first allocate vacant lands within the municipal area. Once vacant municipal lands are exhausted, land within the planning area is proposed for further development and use. Based on the percent of population in each economic class and the corresponding plot sizes, the total residential area required within the town to meet the housing need of 15,262 houses in 2041 would be 549.43 hectare as shown in **Table 15.2**.

As discussed in section 12.2, the residential area in 2022 is 1985 hectare. Figure 15.1 and Figure 15.2 depict spatial allocation of land for residential area for balanced development of the town, proposed residential area has been recommended primarily in the eastern direction. Vacant land measuring 549.43 hectares of land has been allocated for residential purpose bounded by the loop. To facilitate the development of residential area, grid iron pattern of road network has been proposed. Considering the

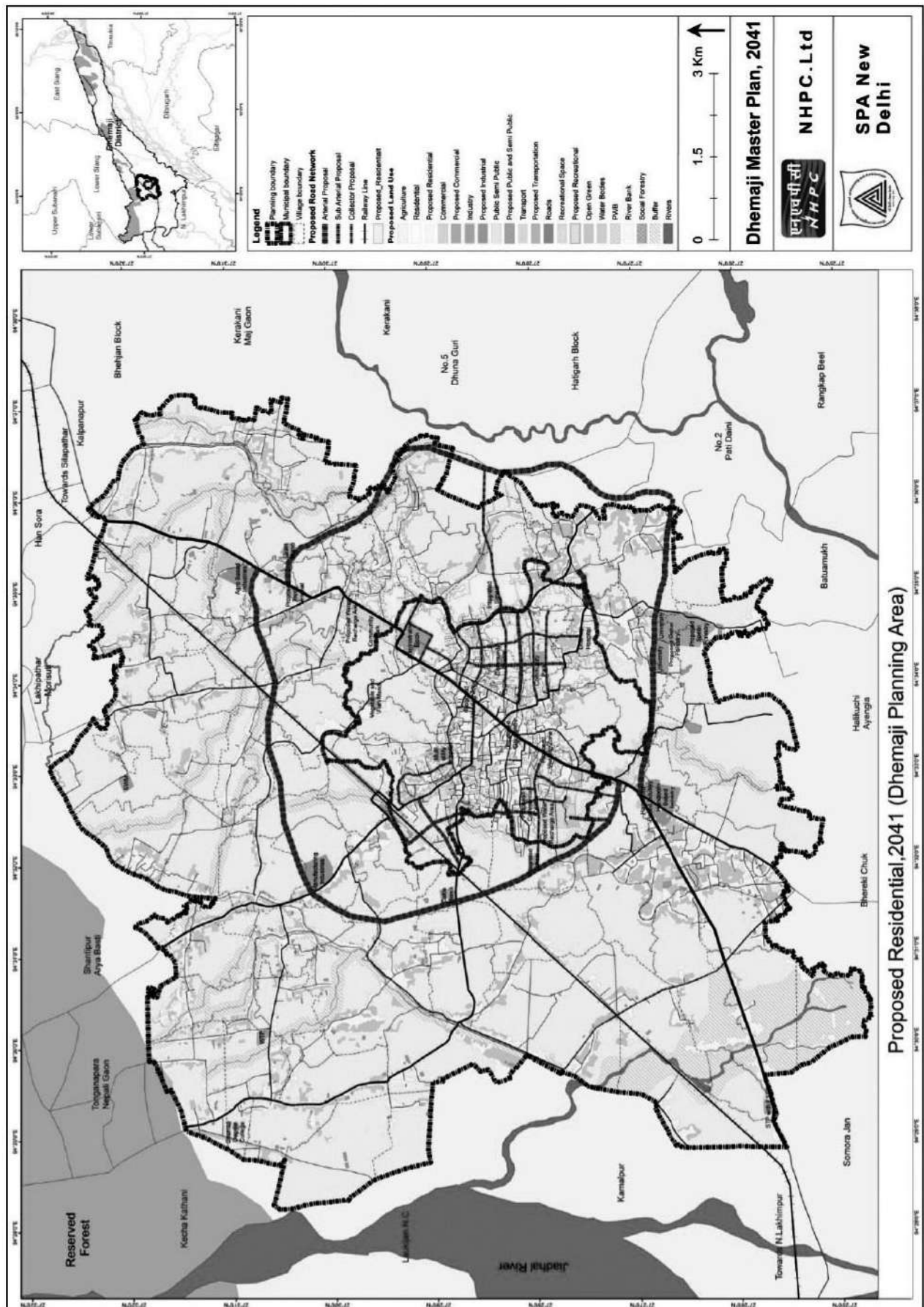
direction of growth, a smaller chunk of residential area is also proposed in the western direction. Proposed residential area is integrated with the existing developments.

Table 15.2: Proposed Plot Sizes for Different Economic Classes for Additional population

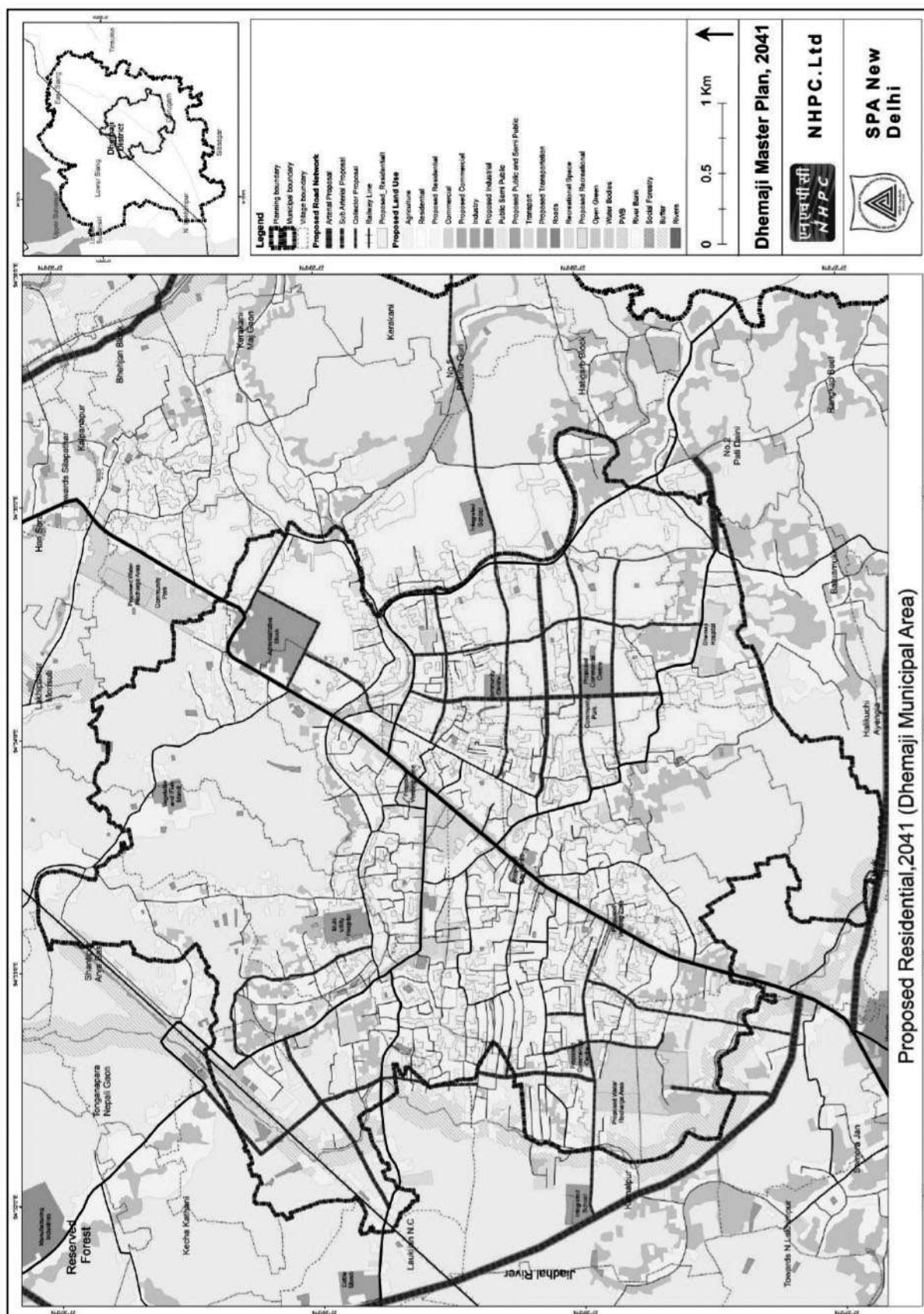
Economic Class	Additional Population		Additional Number of HH	Proposed Plot Sizes (sq m)	Proposed Residential area (Ha)
	Percent	Numbers			
Economically Weaker Section	30	20,146	4579	100-200	91.57
Low Income Group	25	16,788	3816	200-300	114.47
Middle Income Group-I	20	13,431	3052	300-400	122.10
Middle Income Group-II	10	6,715	1526	400-500	76.31
High Income Group-I	10	6,715	1526	500-600	91.57
High Income Group-II	5	3,358	763	600-700	53.42
Total		67,153	15,262		549.43

Note: Land for residential use is calculated based on higher side of each plot range.

Source: SPA New Delhi (2022).

Figure 17.3: Proposed Road Levels in Dhemaji Planning Area, 2041

Source: SPA New Delhi (2022).

Figure 15.2: Proposed Residential Area in Dhemaji Town, 2041

Source: SPA New Delhi (2022).

CHAPTER 16: ECONOMY

16.1 Introduction

Dhemaji Master Plan 2041 aims to accelerate economic growth in the area by generating employment opportunities for the youth. For this, it is necessary to promote the establishment of micro, small and medium enterprises as well as industries. By focussing on increasing the share of secondary and tertiary sector, the problem of unemployment can be resolved to a greater extent. Adequate infrastructure proposals have been made as per the potential of the area in terms of its resource base.

16.2 Trade and Commerce

For the development of trade and commerce, there is a need to rejuvenate and redevelop the existing commercial area with better accessibility and parking spaces, and allocate additional area for commercial activities. Dhemaji Master Plan 2041 proposes to shift government offices from the town's centre to the north of the municipal area. This would create enough space for developing a City Centre for commercial activities on the land vacated by the existing administrative offices near Tiniali junction. The reason for proposing commercial area at this location is primarily because of its excellent accessibility. The commercial development hence proposed would help in generating additional revenues for the government. Additional revenues are required for continual maintenance of the town by the Municipal Board, which is not possible with the current low tax base. As properly planned modern commercial hub gets developed, and more people begin to visit the town centre, more parking spaces would be required. It is proposed that parking places should be built within the commercial complexes. Overall, the major commercial areas for Dhemaji have been proposed along NH15 and Station Road up to a distance of 50 meter on both sides of the arterial roads as shown in Figure 16.1 and Figure 16.2. Additionally, an area of 4 hectares has been allocated as vegetable and fish mandi within the town which will serve as a trading hub for vegetables, fruits and fish. Similarly, an area of 5 hectare each for grain mandi and cattle mandi has been also proposed. The cattle mandi would lie near the railway station and the grain mandi near NH15, making these readily accessible.

Legend

- Planning boundary
- Municipal boundary
- Village boundary
- Proposed Road Network
- Proposed Land Use
- Proposed Commercial
- Proposed Residential
- Proposed Industrial
- Proposed Public and Semi Public
- Proposed Transportation
- Proposed Recreation
- Proposed Open Space
- Proposed Green
- Proposed Water Bodies
- Proposed PWS
- Proposed River Bank
- Proposed Social Forestry
- Proposed Buffer
- Proposed Rivers

Scale: 0 1.5 3 Km

North Arrow

Dhemaji Master Plan, 2041

NHPC Ltd

SPA New Delhi

Proposed Commercial, 2041 (Dhemaji Planning Area)

Source: SPA New Delhi (2022).

The map displays the Dhemaji Municipal Area with various land use zones. Key features include:

- Legend:**
 - Planning boundary
 - Municipal boundary
 - Stage boundary
 - Proposed Road Network
 - Proposed Arterial Road
 - Proposed Sub Arterial Road
 - Proposed Collector Road
 - Proposed Railway Line
 - Proposed Land Use
 - Proposed Residential
 - Proposed Commercial
 - Proposed Industrial
 - Proposed Public and Semi Public
 - Proposed Transport
 - Proposed Recreational
 - Proposed Open Space
 - Proposed Open Green
 - Proposed Water Bodies
 - Proposed River Bank
 - Proposed Social Forestry
 - Proposed Buffer
 - Proposed Rivers
- Scale:** 0 to 1 Km
- North Arrow:** Indicated by an arrow pointing upwards.
- Map Title:** Dhemaji Master Plan, 2041
- Proposed Commercial, 2041 (Dhemaji Municipal Area)**

Source: SPA New Delhi (2022).

16.3 Informal Markets

Dhemaji Master Plan 2041 aims to foster inclusive economic growth. To achieve this goal it is necessary that due importance is given to the informal sector which includes street vendors, vegetable sellers, fruit sellers, etc. So, a land measuring 1 hectare has been proposed as a vending zone near Tiniali junction where the old ASTC Bus stand was located. Since the Master Plan proposes to relocate this bus stand as would be discussed in section 17.3. This area can be transformed into a retail market for vegetables and fruits for the local community. Located near the City Centre, the vending zone would be easily accessible. It can be developed in a phased manner as an attempt to protect the interests of the vulnerable sections of the community.

16.4 Industries

For urban areas, industries are enablers of economic development and employment generation. As indicated in the analysis, Dhemaji Planning Area has been bereft of industrial development for too long. Except for a few small scale rice mills, there are not any significant industries located within the town.

Since Dhemaji is known for its production of *muga* silk and has a workforce trained in weaving and handloom, there is immense potential for the development of silk-based handloom industries in the area. It is also proposed that the state government should play a major role by providing financial incentives for the growth of small and medium scale handloom enterprises in the Planning Area. Raw materials that are now being shipped out of the district could be used for domestic production. The master plan offers 34 hectares of land near the bus stand, towards the south of the town for handloom-based industries, as shown in Figure 16.3 and Figure 16.4. A handloom market is also proposed along NH15, which would serve as a suitable place for weavers to sell their products, diminishing the involvement of middlemen or traders. This would help weavers in widening their businesses and making higher profits.

Since agriculture sector contributes significantly to the economy of Dhemaji, the Master Plan suggests promotion of intensification of agriculture. Improved irrigation facilities should be prioritised so that commercial crops can be planted twice a year, resulting in higher yields and improved farm income.

Legend

- Planning Boundary
- Municipal Boundary
- Village Boundary
- Proposed Road Network
- Proposed Arterial Road
- Proposed Sub-Arterial Road
- Proposed Collector Road
- Proposed Local Road
- Proposed Industrial
- Proposed Residential
- Proposed Commercial
- Proposed Public and Semi Public
- Proposed Transport
- Proposed Health
- Proposed Education
- Proposed Recreation
- Proposed Open Space
- Proposed Green
- Proposed Water Bodies
- Proposed River Bank
- Proposed Social Forestry
- Proposed Buffer
- Proposed River

Scale: 0 1.5 3 Km

Dhemaji District Master Plan, 2041

NHPC Ltd

SPA New Delhi

Proposed Industries, 2041 (Dhemaji Planning Area)

Source: SPA New Delhi (2022).

Legend

- Existing boundary
- Municipal boundary
- Village boundary
- Proposed Road Network
- Proposed Sub-Arterial Road
- Proposed Collector Road
- Proposed Local Road
- Proposed Land Use
- Proposed Residential
- Proposed Commercial
- Proposed Industrial
- Proposed Public and Semi Public
- Proposed Transport
- Proposed Recreation
- Proposed Open Space
- Proposed Water Body
- Proposed River Bank
- Proposed Social Forestry
- Proposed Buffer
- Proposed River

Dhemaji Master Plan, 2041

NHPC. Ltd

SPA New Delhi

Scale: 0 0.75 1.5 Km

Proposed Industries, 2041 (Dhemaji Planning Area)

Source: SPA New Delhi (2022).

The Assam government should promote sericulture in rural areas by giving suitable incentives for household level small scale industries engaged in weaving and handloom.

From an industrial perspective, the agro-based economy of Dhemaji provides room for the development of agro-based industries such as rice mills, oil manufacturing, etc. For this, a land of 20 hectares has been allocated towards the north of the Planning Area.

Automobile-based small-scale workshops have sprung up along NH15, particularly in the outer wards. Apart from this, a significant number of manufacturing industrial units for metal fabrication, wooden furniture, bamboo items, etc. are present in the Planning Area which is indicative of the scope for future development in this sector. So, 25 hectares of land has been allocated for manufacturing industries in the vicinity of Dhemaji Railway Station for maintaining high accessibility across the region. It has been kept away from the town to protect residential areas from the resulting air and noise pollution.

CHAPTER 17 : TRAFFIC AND TRANSPORTATION

17.1 Introduction

Mobility is the lifeblood of a town and Dhemaji is no exception. Safe, affordable and fast movement of people, goods and services is significant for the growth of a town. Traffic and transportation provides a crucial spatial link between various land uses and activity systems. Urban settlements grow or decline based on critically important mobility. Congested towns where citizens are stuck for hours together on the roads are not great economic growth generators. Towns with great public transport systems perpetuate economic growth and enhance greatly the quality of life for its citizens.

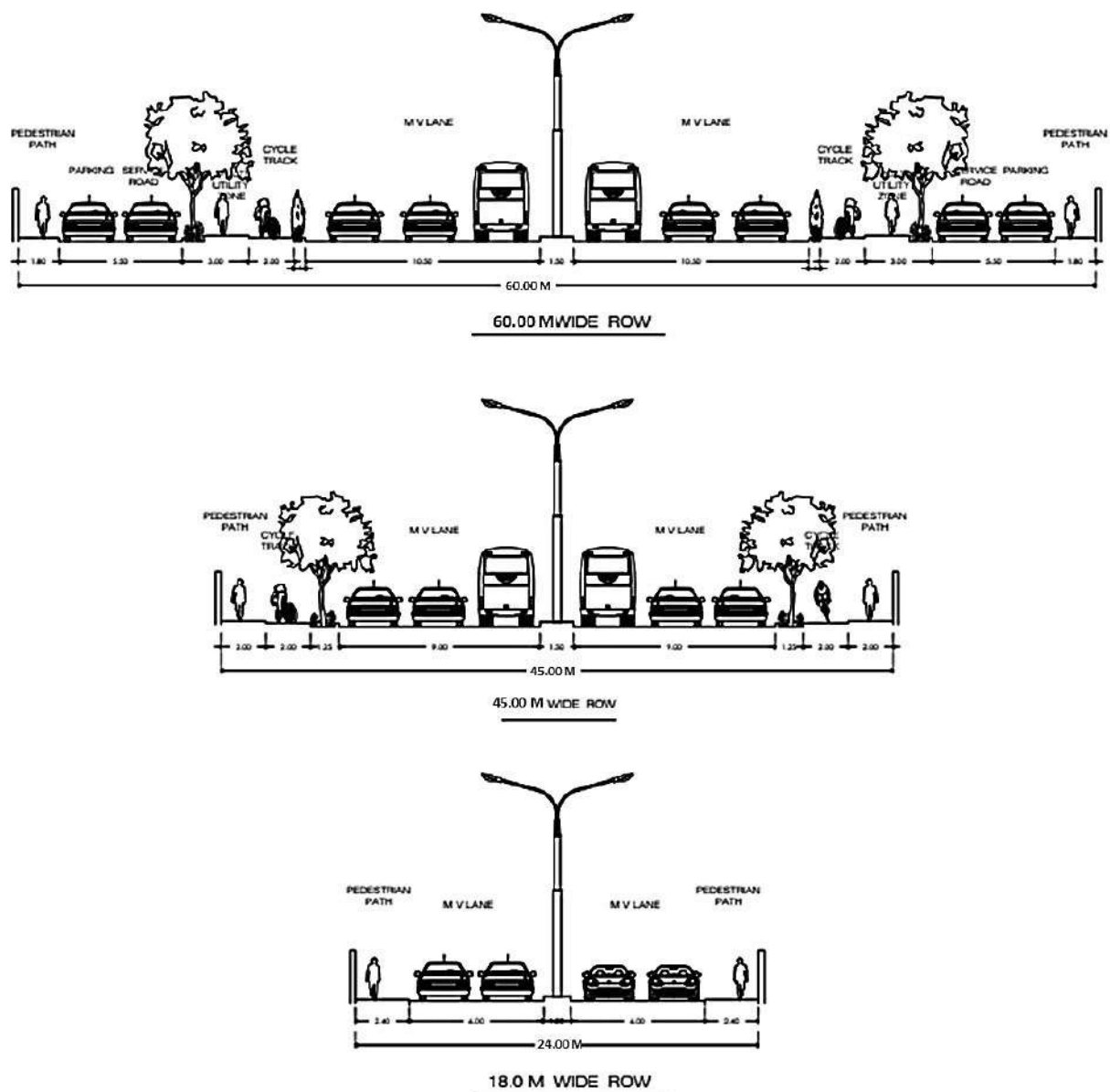
Master Plan 2041 aims to improve connectivity within as well as outside Dhemaji town. The enhanced connectivity will increase accessibility to facilities and hence, accelerate development.

17.2 Proposed Road Network

The existing road network of Dhemaji is relatively well developed. For example, NH15 divides the town into two parts. It passes through core area of Dhemaji and has the right of way (RoW) of 30 m. This forms the main arterial road of Dhemaji. The RoW is adequate to cater to traffic upto 2041. Although there is no need of road widening, it is proposed that it should be widened upto 40 m keeping in view proposed commercial activities in the town center. It must be also ensured that the road is protected from encroachments.

On the western side, parallel roads like Station road and Ratanpur road have sprung out of NH15. These roads are well distributed with a gap of half a kilometer. They provide connectivity between the main roads and residential areas of Dhemaji town. Network of local roads is also well developed. However, there is no major road connecting the parallel roads which increases the travel distance to access facilities. Because of this, Station road experiences heavy traffic. Hence, the traffic load on Station road is planned to be distributed by proposing a network of parallel roads. Possible road widening of Ratanpur road is also proposed to enable it to function as sub-arterial road.

On the eastern side of NH15, the Civil Hospital Road is the main road. Residential development has sprawled along this road. The PNGB road which stems out of NH15 passes through Pahukari Jan and joins the Civil Hospital Road forming a loop. Residential developments are seen only along these roads. The land within the loop remains relatively undeveloped. The Master Plan 2041 proposes to develop land locked within this loop. Residential development along with commercial and public semi-public facilities is proposed in this area. To facilitate this development, a system of grid iron pattern of road network in a 500 m by 500 m grid is proposed. The existing road network and built up area is taken into consideration while developing proposed road network. It is ensured that proposed alignment of roads does not affect the existing built up area. Arterial roads are proposed with 60 meter right of way, sub-arterial roads are proposed to be with 30 meter right of way, and collector roads are proposed to be with minimum 18 meter right of way. Proposed cross sections of these three types of roads are presented as per IRC 86 and are shown in Figure 17.1.

Figure 17.1: Cross-sections of Proposed Roads, 2041

Source: IRC-086 (2018).

17.3 Inter State Bus Terminal

The existing bus stand within the core area of Dhemaji town contributes immensely to traffic congestion along NH15. But the newly built bus stand located towards the south near Telijan along NH15 is not yet made operational. The area of this bus stand is 1.1 hectares. With further extension, it should be upgraded to function as Inter State Bus Terminal. For this, 5 hectares of land is allocated adjoining the bus stand. The Master Plan proposes to shift the old bus stand completely to this new location as it would reduce traffic volume on NH15 to a great extent. The land hence vacated would be used as a vending zone as discussed above.

17.4 Proposed Bypass

Connectivity outside Dhemaji Municipal Area is developed through the provision of a bypass. The bypass to NH15 on the eastern side passes through Matikhula, Simalgiri and Tangana Para Nepali villages. This part of the bypass has already been sanctioned by the Assam Government. However, the construction of the bypass has not yet started. The length of the Bypass on this side is 14 km. This bypass provides connectivity to major proposals like University, Grain Mandi, etc.

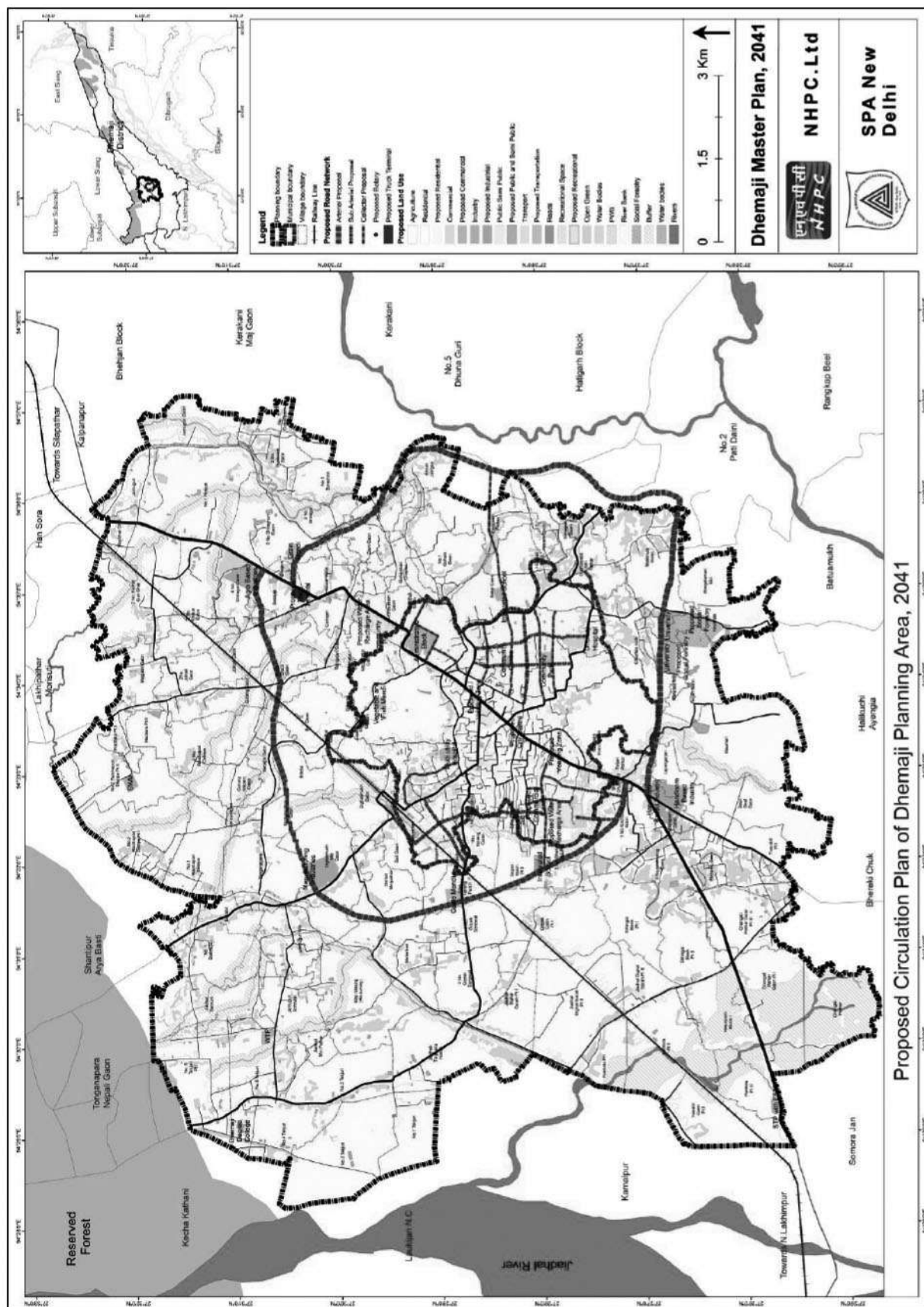
Dhemaji Master Plan 2041 further proposes to develop the western side of the Bypass. This Bypass connects Jamugiri Panchali, Dhigalimukh Miri, Dhigali Pathar, Bor Gaon, Rangajan on western side with a length of 12 km. Major activities like manufacturing industries, cattle mandi, etc. have been proposed on this side. The Bypass is bound to increase connectivity in Dhemaji Planning Area. The road network of Dhemaji town is being extended to connect with the Bypass.

17.5 Truck Terminal

The truck terminal is required to cater to the logistics requirements of the newly proposed industrial area and mandis. One truck terminal has already been sanctioned near the Bypass in the north direction. Another truck terminal is being proposed near the Bypass in the southern direction. Figure 17.2 depict the proposed road network along with the major transportation facilities.

The levels of all major roads have also been fixed from the mean sea level for the effective and accurate execution of the proposed road network. Contour lines at a distance of 3m were generated for the entire planning area and the contour levels were obtained along major roads using the Digital Elevation Modelling (DEM) data for the planning area. The contour levels of the planning area range between 87m on the western side to 111 m on the eastern side. Contour points along the major roads have been shown in Figure 17.3.

Source: SPA New Delhi (2022).



Source: SPA New Delhi (2022).

CHAPTER 18: PHYSICAL INFRASTRUCTURE

18.1 Water Supply

Water supply management in Dhemaji town needs extensive development as currently there is absence of piped water supply to households. As per Central Public Health Environmental Engineering Organization (CPHEEO) manual on Water Supply and Treatment 1999, 135 litres per capita per day (lpcd) of potable water should be supplied in urban areas with population more than 1,00,000. As the projected population for the Planning Area is 1,45,000, the total water demand is calculated to be 19.6 million litres per day (MLD) for year 2041. Considering 20 percent losses which include transmission losses, theft and leakages, total losses come out to be 4 MLD. Fire demand which is calculated by multiplying 100 to the square root of projected population is calculated as 0.04 MLD (CPHEEO, 1999). The actual water demand and gap is calculated as 25 MLD for the year 2041.

To meet projected water demand, Water Treatment Plant (WTP) has been proposed with a capacity of 25 MLD. The location of WTP has been proposed near Jiadhal River around Jiadhal Miri Pathar village and No. 5 Tekjuri village. The design period for WTP will be 15 years as recommended by CPHEEO 1999 guidelines. Distribution network will be designed for 30 years.

Jiadhal River is a perennial river which is a sub-tributary of Brahmaputra River with the total catchment area of 533.48 sq km (Water Resource Department Dhemaji, 2021). As per URDPFI 2015, the area required for 25 MLD WTP is 1 hectare. However, if scope of future expansion is taken into consideration, water supply requirement would amount to 40 MLD and the area required would be 4 hectare (see Table 18.1). As the general slope of land is from north-west to south-east direction, the location of WTP is selected so as to reduce electricity consumption as well as cost of pumping. This is because gravitation force will suffice the force required to supply treated water from the WTP to storage reservoirs.

Table 18.1: Proposal for Physical Infrastructure in Dhemaji Town.

Water Supply	
Total Water Demand (in MLD) @ 135 lpcd	19.6
Total Losses (in MLD) @ 20 percent	4
Fire Demand (in MLD) @ $100\sqrt{\text{Population}}$	0.04
Actual Water Demand (in MLD)	23.6
Existing Supply (in MLD)	0
Demand Gap (in MLD)	23.6
Proposed Water Supply (in MLD)	25
Scope of future expansion to (in MLD)	40
Area required for Water Supply System as per URDPFI (in Ha)	1
Actual Area provided (in Ha)	4.0
Capacity of Overhead Tank (OHT) (in Lakh litres)	25
Number of OHT required	10
Area Required per OHT (in Ha)	0.5
Total Area Required (in Ha)	5.0
Sewerage Generation (considering 80 percent conversion of water supply)	
Sewerage Generation (in MLD)	19.0
Capacity of Sewerage Treatment Plant (in MLD)	20.0
Area required for Sewerage Treatment Plant as per URDPFI (in Ha)	1
Actual Area provided (in Ha)	4
Drainage Network	
Average Annual Rainfall (in mm)	3,200
Maximum Rainfall Recorded during 30 days (in mm)	850
Assuming Highest Rainfall during 30 days (in mm)	1,000
Total Area (in Ha)	134.5
Total Runoff (in cubic metre per 15 minutes)	24,300
Total Capacity of Drainage Network (in cubic metre)	25,000
Solid Waste Management	
Total Waste Generation (0.4 kg per capita) (metric tonnes per day)	58

Source: SPA Delhi (2022).

Filtration methods in Water Treatment Plant will have four stage water cleansing procedure as recommended in CPHEEO 1999 guidelines. The preliminary stage involves passing of raw water from protective bar and screening bar to eradicate heavier particulates. In the primary stage, raw water after preliminary stage is passed through aerators to increase dissolved oxygen. This process reduces odour and colour present in raw water. In the secondary process, raw water is mixed with chemicals to facilitate sedimentation and flocculation and to eradicate suspended particulates from raw water. The treated water is then disinfected by using chemicals such as chlorine.

Additional chlorine is added to treated water to keep water disinfected during supply process. Treated water is then pumped to storage reservoirs. Pipeline network is uniformly placed in the entire town. The network will be equipped with pressure valves and check valves as per the engineering standards. High emphasis will be given to reduce transmission losses, leakages and theft. Every household within the town will be connected with proper metering system.

18.2 Over Head Tank (OHT)

Ten OHTs will be required for Dhemaji town. The area required for one OHT will be 0.5 hectare which consists of a guard room, pump room and inspection room. The base of tank will be 15 to 20 meters high from ground level depending on the engineering requirements. The volume of tank is calculated as 25 lakh litres each to suffice distribution of 25 MLD water for Dhemaji town (see Table 18.1). As per suitable design, if the shape of a tank is rectangular, the dimensions will be 10 metres height, 15.82 metres length and width. If the shape is cylindrical, the OHT will be 10 metres high and 18 metres in diameter. The placement of OHT is proposed as per population distribution so as to cover every household in the town.

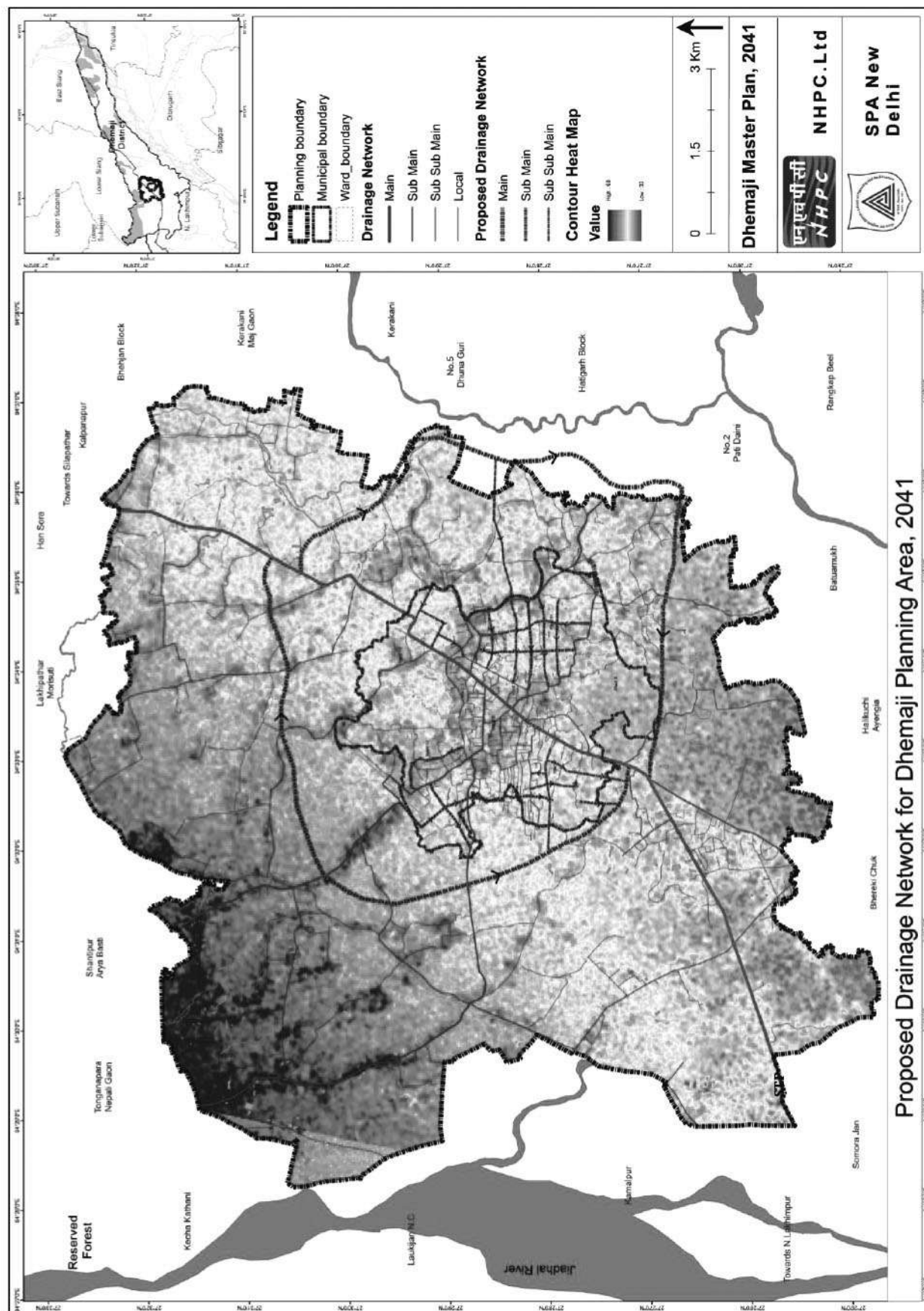
18.3 Drainage Network

Natural disasters due to flooding are a frequent and prominent occurrence in Dhemaji town. To mitigate flooding, a comprehensive drainage network is proposed for the entire town. Dhemaji town, according to meteorological data provided by 'World Weather', has recorded peak rainfall of 850 millimeters (mm) over a period of 30 days. For extra coverage, the network is designed by assuming peak rainfall of 1,000 mm over same period. Therefore, rainfall per day will be 33.34 mm or 1.31 inches. To calculate peak storm water discharge, formulae of discharge has been used which is a product of coefficient of runoff (C), catchment area and rainfall intensity.

Coefficient of Runoff has been taken as 0.45 for open fields and 0.75 for built-up or constructed area. Hence, peak storm water discharge is calculated as 97,200 cubic metres per hour. Considering storage capacity of the drainage network as 15 minutes, the drainage system is designed to store a volume of 24,300 cubic metres (or 25,000 cubic metre) of water as shown in **Figure 18.1**.

The length of main drainage line is approximately 50 km along the proposed arterial roads, 41 km for sub-main drains along sub-arterial roads and branch drain of length 60 km along collector roads.

The drainage system is designed on the principle of *water sensitive planning* whereby water collected from stormwater runoff will be discharged into artificial lakes proposed within parks and urban forests. This will help increase ground water levels and the excessive runoff would be utilized for irrigation. Drainage lines will be fully covered to avoid pollutants from entering the drainage channels which may lead to blockages. Monthly inspection of drainage lines is recommended to monitor their functioning.

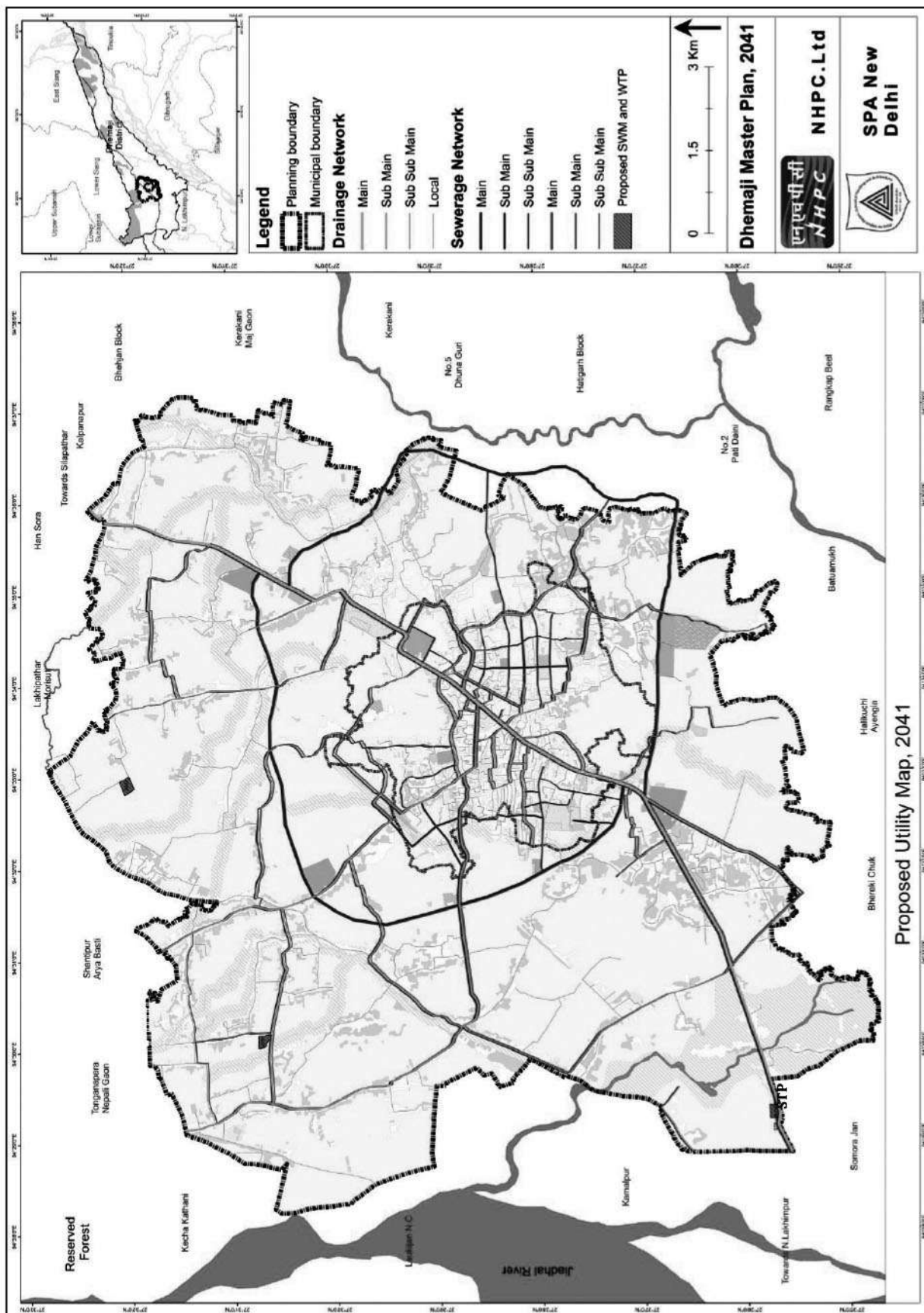
Figure 18.1: Proposed Drainage Network for Dhemaji Planning Area, 2041

Source: SPA New Delhi (2022).

18.4 Sewerage System

Most households in the town are dependent on septic tanks for disposal of faecal waste. However, without achieving safe water supply standards, operation and maintenance of effective sewerage network is not feasible. As 25 MLD water supplies till 2041 is already proposed, an effective sewerage system is necessary to channelize black water towards treatment plant which is proposed to have the capacity of 25 MLD, considering conversion factor of 80 percent between supplied water to sewerage, as suggested by CPHEEO manual on Sewerage and Sewage Treatment Systems 2013 (see Table 18.1).

The proposed location of the Sewerage Treatment Plant (STP) is along NH15 in Narabil Gaon Village near railway track with an area of 4 hectare. Sewerage treatment plant is designed for 15 years and conventional sewers are designed for 30 years **Invalid source specified..** The STP will treat effluents by Active Sludge Digestion process which is most commonly used in STPs across India. The proposed STP will be equipped with Faecal Sludge Treatment Plant (FSTP) to cater to the treatment demand of faecal collected in septic tanks till operation of sewerage network is achieved. FSTP will be functional for areas where sewer network is not laid. Zero tolerance policy should be implemented against human scavenging and violators should be heavily penalized for their negligence. Entire procedure of septic tank cleaning should be mechanically executed with minimal human involvement. Treated effluents from STP and FSTP will be discharged in Jiadhal River. Common Effluent Treatment Plants (CETPs) have been proposed within industrial areas for adequate treatment of wastewater from industries before discharging them into water bodies or drainage channels. Figure 18.2 shows the Proposed Sewerage System for Dhemaji Planning Area, 2041.

Figure 18.2: Proposed Utility System for Dhemaji Planning Area, 2041

Source: SPA New Delhi (2022).

18.5 Solid Waste Management

Management of Solid Waste is a major challenge that Dhemaji town is facing. The consequences of openly dumping of Solid Waste can be severe as it can cause various health and environmental issues. To mitigate this, a Waste Management Site has been proposed with an area 5 Ha in Moridhal Ghat village along NH15 near the railway track as shown in Figure 18.3. Land for the same has already been sanctioned by the Municipal board.

Per Capita waste generation in Dhemaji town is around 0.3 kg waste per day. However, to increase the capacity of waste management, 0.4 kg has been considered. Hence, total waste generation for the year 2041 will be 58 metric tons per day (see Table 18.1).

The waste management site will be equipped with plastic reuse mechanism, waste paper recycling unit and decomposition of organic waste for organic compost manufacturing which can be used by nearby cultivators for crop production. Waste collecting vehicles will be covered and will have separate chambers for dry and wet waste to facilitate segregation at source. These vehicles will collect waste on daily basis and deliver the waste to the Waste management site.

For effective waste management, residents will be encouraged to use two separate bins for dry and wet waste so that on-site segregation of waste can be achieved. Public dustbins will also be equipped with two separate chambers. For the safety of waste collectors, it is advised that they wear protective gloves, masks, glasses and helmets in their working hours. Provision for regular health checkup of waste collectors should be made free of cost to ensure their optimal health.

Legend

- Panchayat boundary
- Village boundary
- Proposed Road Network
- Annual Proposal
- Sub Annual Proposal
- Collector Proposal
- Railway Line
- Proposed Waste Management Site
- Proposed Land Use
- Agriculture
- Residential
- Proposed Residential
- Commercial
- Proposed Commercial
- Industry
- Proposed Industrial
- Public Open Space
- Proposed Public and Semi Public
- Treepart
- Proposed Transportation
- Recreational Space
- Proposed Recreational
- Open Green
- Water Bodies
- PWS
- River Bank
- Social Forestry
- Buller
- Rivers

Dhemaji Master Plan, 2041

NHPC.Ltd

SPA New Delhi

Proposed Waste Management Site ,2041 (Dhemaji Planning Area)

Source: SPA New Delhi (2022).

CHAPTER 19: SOCIAL INFRASTRUCTURE

19.1 Educational Institutes

According to Urban and Regional Development Plan Formulation and Implementation (URDPFI) Guidelines 2015, a middle school is required for every 5,000 population. As the projected population for 2041 is calculated as 1,45,000, the number of middle schools required is 29. Similarly, one secondary school is required for every 5,000 population and hence, the required number of secondary schools for year 2041 is 29. Currently, 21 secondary schools exist in the Planning Area. So, eight additional schools will be required till 2041. This need and demand would be met by upgrading eight middle schools to secondary schools.

The requirement for one senior secondary school is for every 7,500 population. By these standards 19 schools will be required for 2041 of which six schools exist in the Planning Area, and thus, additional 14 schools are proposed. Area provided for each school is two hectares. According to URDPFI 2015, area required per senior secondary school is 1.8 hectares. Of this, 0.60 hectare area will be dedicated to school building, one hectare to playground and 0.2 hectare to parking facilities. The total area proposed for senior secondary school is 28 hectares (**see Table 19.1**). These schools will be located near residential areas so as to reduce travel distance for students and guardians.

According to the URDPFI 2015, one integrated school without hostel facility is required for a population of 1,00,000. Currently three integrated schools exist in Dhemaji which is sufficient to fulfil the requirement of two schools for the year 2041. However, two additional integrated schools with hostel facilities are required for 2041 of 4 hectares area each. The area is distributed as, 0.7 hectare for school building, 2.5 hectares for playfield, 0.50 hectare for hostel facilities and 0.30 hectare for parking facilities. Total area required will be 8 hectares (**see Table 19.1**). One integrated school has been proposed in Bakal Goan village adjacent to the proposed Ring Road and the other school is proposed in Gopak Goan village near the proposed Ring Road. These locations are outside municipal boundary but near the residential areas. Dhemaji does not have a school for physically challenged which is required at a ratio of one school per 45,000 population. For the year 2041, there will be a requirement of four such schools. As per

URDPFI 2015, area required per school is 0.7 hectare. However, 1 hectare of area is proposed. Hence a total of 4 hectares of land will be required. The location of these proposed schools is strategically distributed within residential areas to reduce travel distance for students and guardians. One school for mentally challenged of area 1 hectare is also proposed within the community centre near the proposed district park in the town. According to the URDPFI 2015, a school for mentally challenged is required for a population of 10,00,000 with an area of 0.5 hectare. The location is peaceful and student friendly with potential for proposing lots of activities for children.

Table 19.1: Proposal for Educational Facilities for Dhemaji Planning Area, 2041

Facility	Population served per unit (URDPFI)	Existi ng 2021	Requi red 2041	Proposal		
				Units	Area required per unit as per URDPFI (Ha)	Additional Area Required (Ha)
Middle School	5,000	118	29	-	-	-
Secondary School	5,000	22	29	Upgrad ation of 8 Middle Schools	-	
Senior Secondary School	7,500	5	19	14	1.8	@2 = 28.0
Integrated School without Hostel	1,00,000	3	2	-	-	-
Integrated School with Hostel	1,00,000	0	2	2	3.9	@4 = 8.0
School for Physically Challenged	45,000	0	4	4	0.7	@1 = 4.0
School for Mentally Challenged	10,00,000	0	1	1	0.5	1.0
Arts College	1,25,000	3	2	-	-	-
Science College	1,25,000	3	2	-	-	-
Commerce College	1,25,000	3	2	-	-	-
Engineering College	10,00,000	1	1	-	-	-
Technical Education Centre (ITI and Polytechnic)	10,00,000	1	1	1	4.0	4.0
University	-	0	1	1	10.0 - 60.0	50.0
Medical College	10,00,000	1	1	0	-	-
Total						95.0

Source: URDPFI, 2015

19.2 Higher Education Institutes

According to the URDPFI 2015, the requirement of arts, science and commerce colleges is one for 1,25,000 population. Currently, there are three arts, science and commerce colleges respectively which are sufficient for the year 2041. An engineering college exists in No. 5 Tekjuri village which is required for a population of 10,00,000. Similarly, one technical education centre (TEC), which consists of industrial training institute (ITI) and polytechnic, is required for the same population (URDPFI, 2015). Currently, there is one ITI situated in Ward 9. However, it does not meet the required standards as recommended in the URDPFI 2015 guidelines. So, one technical education centre is proposed within the university campus which is proposed along Ring road in southern direction outside municipal boundary. Area of the proposed university will be acquired from Telijan village, Kowafala Miri village and Kowafala village. The location of the university is decided so that the development of the town is evenly distributed as we observe that development of the town is currently moving towards northern and eastern directions.

The location of the proposed university is strategically decided with respect to the entire Dhemaji District. The total area of the university campus is proposed to be 50 hectare of which 30 hectare will permanently remain under urban forest and 4 hectare is dedicated to TEC. The TEC consists of ITI with an area of 1.6 hectare and a polytechnic with an area of 2.4 hectare. The dedicated land for the proposed university is 16 hectare of which 25 percent (4 hectare) is dedicated to residential area, 15 percent (2.4 hectare) is dedicated to Sports and Cultural Activities and 15 percent (2.4 hectare) is dedicated to parks and landscape including green belt (URDPFI, 2015). Proposal for medical college already exists near the Civil Hospital within the municipal boundary (see Table 19.1).

19.3 Medical Facilities

According to the URDPFI 2015, there should be one dispensary for a population of 15,000. Currently, there is only one dispensary in Dhemaji town and one outside the municipal area. However, the requirement for the year 2041 is calculated as 10 which imply that 8 additional dispensary units need to be developed. The area required for one dispensary is 0.1 hectare. Hence, the total area required for dispensaries is 0.8

hectare. These dispensaries will be located near residential locations to reduce travel distance for patients.

According to the URDPFI 2015, One Family Welfare Centre is required to serve a population of 50,000 with an area requirement of 0.08 hectare. Currently, there is one centre present within the town. For year 2041, three centres will be required. So, two centres are proposed within residential area within the planning boundary with an area of 0.5 hectare each. The total land required is 1 hectare. As per the URDPFI 2015, a Maternity and Child Welfare Centre, consisting of 30 beds is required for population range of 45,000 to 1,00,000. Currently, there is one centre within the town. An addition requirement of one more centre for the year 2041 exists. The area required is 0.5 hectare. Dhemaji requires one General Hospital with 500 beds capacity. As per the URDPFI 2015, a General Hospital is required for a population of 2,50,000. The area required for General Hospital is 6 hectare of which 4 hectare will be dedicated to the hospital and 2 hectare will be utilized for residential purposes (see Table 19.2). The location of the proposed General Hospital is in Ward 3. The location is excellent as it is near residential areas of the town and has good connectivity with NH15 facilitating use by all residents of the entire district. There is an existing Veterinary hospital within the town which will be sufficient to cater to the needs of animals for 2041 (see Table 19.2).

Table 19.2: Proposal for Medical Facilities for Dhemaji Planning Area, 2041

Facility	Population served per unit (URDPFI)	Existi ng	Requi red	Proposal		
		2021	2041	Units	Area required per unit as per URDPFI (Ha)	Additional Area Required in Ha
Dispensary	15,000	2	10	8	0.1	0.8
Specialty Hospital (200 Beds)	1,00,000	1	1	0	-	-
General Hospital (500 Beds)	2,50,000	0	1	1	6.0	6.0
Family Welfare Centre	50,000	1	3	2	0.08	@0.5 = 1.0
Maternity/Child Welfare (30 Beds)	45,000-1,00,000	1	2	1	0.3	0.5
Veterinary Hospital	5,00,000	1	1	-	-	-
Total						8.3

Source: URDPFI, 2015

19.4 Socio-cultural Facilities

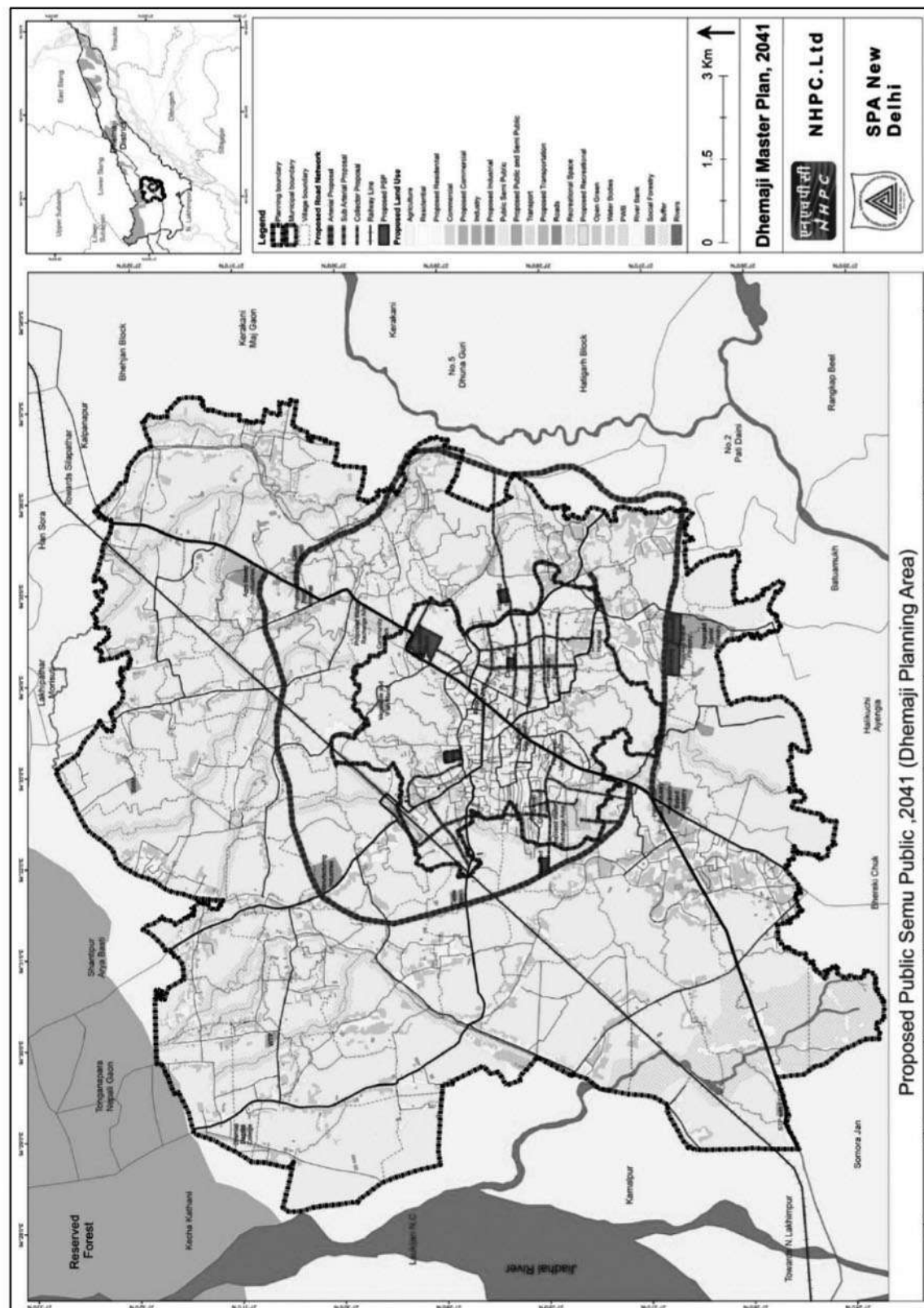
Socio-cultural facilities include community hall which is required for every 15,000 population as per the URDPFI 2015 Guidelines. Currently, there is only one community hall within the town and an additional nine units will be required for the year 2041. As per standards, area required for each community hall is 0.2 hectare. However 0.5 hectare of land is allotted to increase Self Help Groups (SHGs) and other community activities. So, the total area required will be 4.5 hectares.

Community halls will be located evenly within residential areas for accessibility of residents of Dhemaji. Recreational club which can be merged with music, dance and drama centre and Meditation and Spiritual centre is required for every 1,00,000 population. The combined area required is 1.8 hectare as per the URDPFI 2015 Guidelines. However, 2.5 hectares is already allocated at two locations, one opposite the proposed local shopping centre in Ward 5 and one in Ward 8 opposite the proposed district shopping centre, to promote spiritual and cultural activities. The proposal consists of a community centre with all these facilities which will be located near Community Park, District Park and residential area for better connectivity and accessibility. One Science Centre is required for a population of 10,00,000 as per the URDPFI 2015 Guidelines. It has been proposed adjacent to the proposed university campus within the planning boundary. The area allotted for the Science Centre is 5 hectare which includes spaces for planetarium, exhibitions, galleries and auditorium.

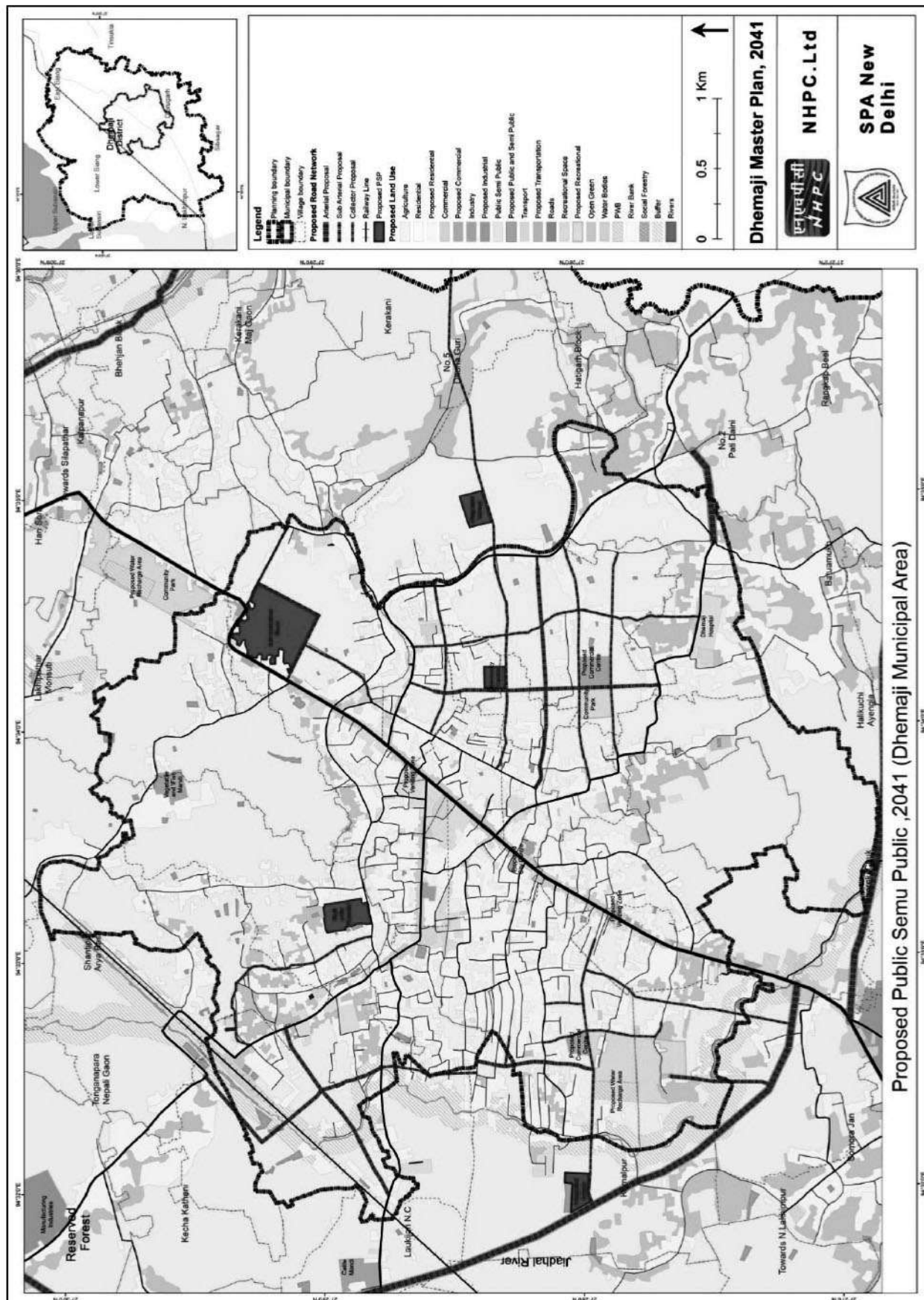
Old age home is required at the ratio of one for 5,00,000 population with 0.5 hectare as per the URDPFI 2015 Guidelines. Proposed old age home is within community centre in Ward 5 near proposed District Park to provide peaceful yet engaging environment for elderly people. The requirement of one police station for every 90,000 population is proposed as per the URDPFI 2015 Guidelines. Currently, there is one police headquarters in Dhemaji town and an additional station with an area of 1.5 hectare will be required for the year 2041 (**see Table 19.3**). This will be strategically located within residential areas of the town so as to maintain law and order within core area of town with best road connectivity to reduce travel time for police personnel. Socio-cultural facilities also include cremation ground which is required for every 5,00,000 population and fire station which is required for every 2,00,000 population (URDPFI, 2015). Currently, there is one cremation ground and one fire station which will be adequate for

the year 2041. Figure 19.1 and Figure 19.2 show the proposed social infrastructure for Dhemaji Planning Area, 2041.

Figure 19.1: Proposed Social Infrastructure in Dhemaji Planning Area, 2041



Source: SPA New Delhi (2022).

Figure 19.2: Proposed Social Infrastructure for Dhemaji Town, 2041

Source: SPA Delhi (2022).

Table 19.3: Proposal for Socio-cultural Facilities for Dhemaji Planning Area, 2041

Facility	Population served per unit (URDPFI)	Existing	Required		Proposal		
		2021	2031	2041	Units	Area required per unit as per URDPFI in Ha	Additional Area Required in Ha
Community Hall	15,000	1	8	10	9	0.2	@0.5 = 4.5
Recreational Club	1,00,000	0	2	2	2	1.0	@1.5 = 3.0
Meditation Centre	1,00,000	0	2	2	2	0.5	@1 = 2.0
Science Centre	10,00,000	1	1	1	1	As per requirement	5.0
Old Age Home	5,00,000	0	1	1	1	0.5	0.5
Police Station	90,000	1	2	2	1	1.5	1.5
Cremation Ground	5,00,000	1	1	1	-	-	-
Fire Station	2,00,000	1	1	1	-	-	-
Total							16.5

Within Community Centre

Source: URDPFI Guidelines (2015).

19.5 Organized Green Spaces

Dhemaji has one playground and one children's park. Currently, there is only one Neighborhood Park which is required for every 15,000 population (URDPFI, 2015). For the year 2041, nine more neighborhood parks will be required with an area of 1 hectare each. These parks will be located in residential areas to increase accessibility for residential dwellers. The town also requires two community parks of 5 hectares each, one of which is located in Ward 9 and is also in the vicinity of the proposed community centre so that both these facilities can be enjoyed simultaneously by the residents of the town.

The area under Children's Park will be increased to 22 hectares and will be redeveloped as a Neighborhood Park, which is located just outside municipal boundary along NH15. There is also a requirement of District Park of an area of 25 hectare which is required for a population of 5,00,000. This park is located within municipal boundary in Ward 5 adjacent to proposed local shopping centre. Fig 18.3 depicts the proposed green spaces in Dhemaji Planning Area and Dhemaji Town for 2041.

Legend

- Planning boundary
- Municipal boundary
- Village boundary
- Proposed Road Network
- Proposed Sub-Arterial Road
- Proposed Collector Road
- Proposed Recreational Space
- Proposed Land Use
- Proposed Residential
- Proposed Commercial
- Proposed Industrial
- Proposed Public and Semi Public
- Proposed Transportation
- Proposed Recreational Space
- Proposed Open Green
- Proposed Water Bodies
- Proposed River Bank
- Proposed Social Forestry
- Proposed Buffer
- Proposed Ponds

Dhemaji Master Plan, 2041

NHPC Ltd

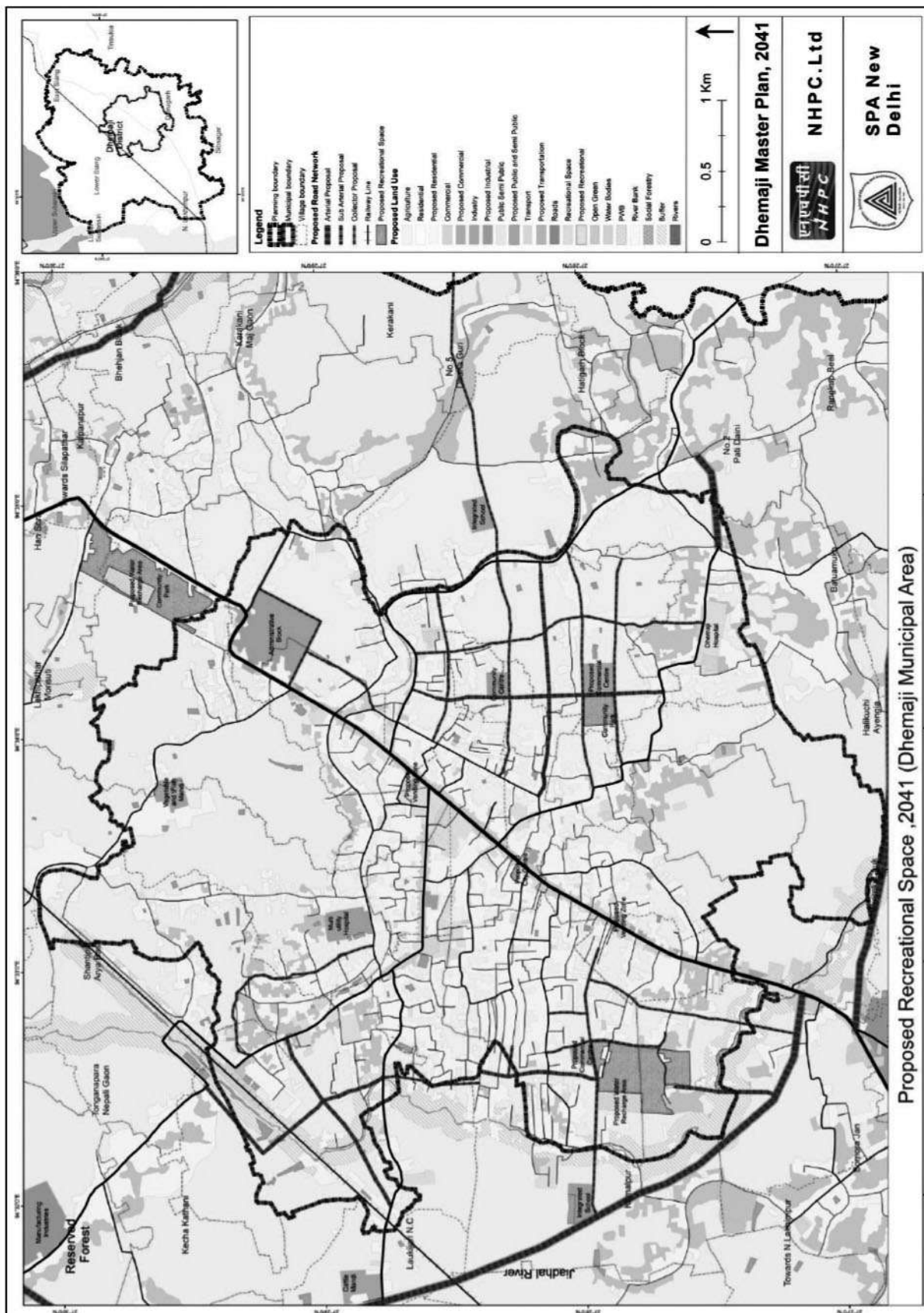
SPA New Delhi

0 1.5 3 Km

Proposed Recreational Space, 2041 (Dhemaji Planning Area)

Source: SPA New Delhi (2022).

Figure 19.4: Proposed Green Spaces in Dhemaji Municipal Area, 2041



Source: SPA New Delhi (2022).

CHAPTER 20: TOURISM

20.1 Introduction

In Dhemaji town, there is scarcity of places of tourists' attraction. Currently there are no tourist attractions located within the town. But due to availability of rivers and views of mountains of Arunachal Pradesh along the northern boundary of Dhemaji district, a number of scenic places for trekking, sightseeing and picnic activities are available. These tourist attractions include waterfall, beautiful landscape of rivers and mountains for picnic activities. Major tourist attractions around the town are religious tourism, leisure and adventure tourism and heritage and cultural tourism. There is however no tourist attraction within the municipal and planning boundary of Dhemaji town. Availability of hotels and other tourist infrastructure is also scarce in the town.

20.2 Tourist Circuit

The main objective of tourist circuit is to connect all potential tourist areas located around a town, so that all tourist areas observe tourist footfall. Tourist areas within 10, 20, and 30 km radius have been included to form the tourist circuit around the town as there are no tourist attractions existing within the town limit. Three tourist circuits are proposed radiating from the town in three different directions. Tourist Circuit 1 is proposed along SH22 moving towards Ghilamara in Lakhimpur district. Tourist Circuit 1 starts from handicraft *haat* proposed within the town and ends at Shri Sankatmochan Hanuman Mandir. This circuit includes Habung Ho Phie, Ghugua Dol and Bardoibam Bird Sanctuary tourist spots. Total length of this circuit is 50 km (see Table 20.1)

Tourist Circuit 2 starts with the proposed handicraft *haat*. It further connects the proposed eco-village where the reserved forest area is located towards the Jiadhalmukhi Picnic spot. Rupohi water fall and Subansiri Dam are the other prominent locations covered in this circuit. Overall, most of the eco-tourism spots are covered in this circuit. Passing through the forest area of Dhemaji district, the circuit shall provide a scenic view of mountains of Arunachal Pradesh as well as rivers. Trekking, picnic, adventure sports, cycling and water sports activities are proposed in the picnic spots and eco village located along this circuit. Total length of this circuit is 38 km (see Figure 20.1).

Tourist Circuit 3 starts from the proposed handicraft *haat* located near the Children's Park and connects Bogibeel Bridge, Rukmini Temple, Archaeological Museum, Malinithan Rukmini temple and Likabali Picnic spot. This circuit is 52 km long moving towards Silapathar. Major religious tourist places are located along this circuit (see Figure 20.1).

Table 20.1: Proposed Tourist Circuits in Dhemaji Planning Area, 2041

Tourist Circuit	Tourist Spots	Length (km)	Type
Tourist Circuit 1	Handicraft Haat, Habung Ho Phie, Ghugua Dol, Bardoibam Bird Sanctuary, Shri Sankat Mochan Hanuman Mandir	50	Religious and Eco-Tourism
Tourist Circuit 2	Handicraft Haat, Eco Village, Jiadhalmukhi Picnic Spot, Rupohi Waterfall, Subansiri Dam, Picnic Spot	38	Leisure and Eco-Tourism
Tourist Circuit 3	Handicraft Haat, Bogibeel Bridge, Archaeological Museum, Rukmini Temple, Malinithan Rukmini Temple, Likabali Picnic Spot	52	Heritage and Religious Tourism

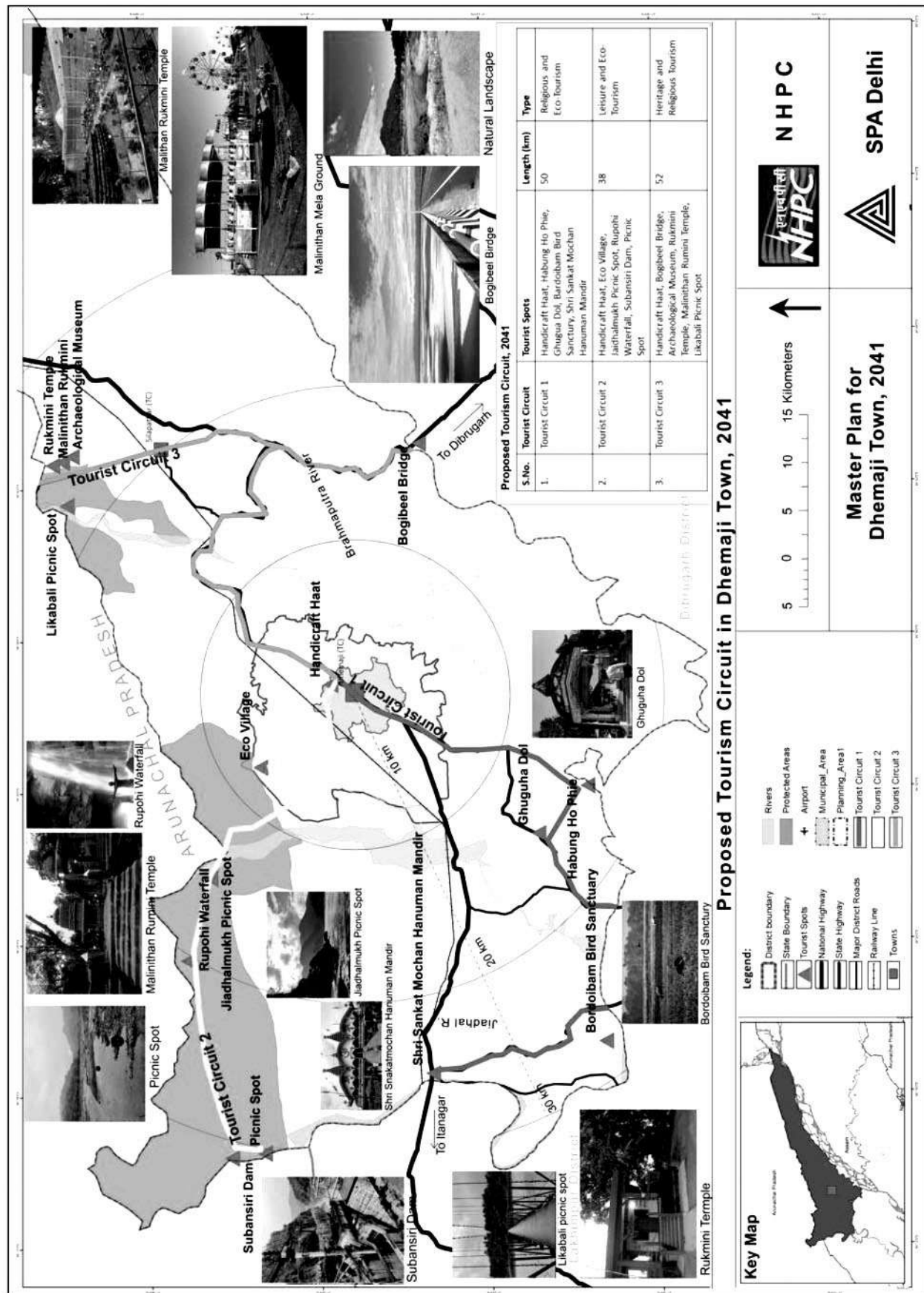
Source: SPA Delhi (2022).

Malini Than is located along Assam - Arunachal Pradesh border, and it is a site of ancient temple ruins. This place has been used to worship Goddess Malini from ancient times. Several historical monuments have also been excavated from this place. An archaeology museum is also located near Malini Than.

Ghuguha Dol is the tourist attraction of religious and historical significance, scenic natural surroundings with a popular picnic spot nearby. It is historically believed that at this place Bamuni Konwar, son of then Ahom King Tyao Khamti was born. The Dol temple was built in the memory of Bamuni Konwar's mother Ghuguhi.

Hanbung Ho Phie is a Hindu temple with unique and rare Tai-Ahom architecture style and scenic natural surroundings located along the Tourist Circuit 1. Bordoibam Beelmukh Bird Sanctuary involving rare and interesting species of local as well as migratory birds (see Table 20.2).

Figure 20.1: Proposed Tourist Circuits in Dhemaji Planning Area, 2041



Source: SPA New Delhi (2022).

Table 20.2: Special Features of Tourist Attraction

Sl.No.	Places of Tourist Interest	Special Features
1.	Ghuguha Dol	Religious and Historical Significance, Scenic natural surroundings, popular picnic spot.
2.	Habung Ho Phie	Hindu Temple with unique and rare Tai-Ahom architectural style, Scenic natural surroundings.
3.	Bordoibam Beelmukh Bird Sanctuary	Rare and interesting species of local as well as migratory birds.
4.	Shri Sankat Mochan Hanuman Temple	Hindu Temple, Popular in local tourists
5.	Subansiri Dam	Surrounded by Scenic hills and Subansiri River
6.	NHPC ferry ghat	Surrounded by Scenic hills and Subansiri River, Popular picnic spot nearby
7.	Rupohi Waterfall	Waterfall surrounded by hills, popular picnic spot
8.	Jiadhalmukhi Picnic Spot	Picnic Spot near Jiadhal River
9.	Ma Malini Than	Religious and Historical Significance, archaeological site, Annual Fair Ground, Popular Cultural gathering Spot.

Source: SPA New Delhi (2022).

20.3 Handicraft Haat

Dhemaji Planning Area has rich intangible heritage because of its handloom, traditional cuisines, folk music and dance. It is famous for its Muga silk production and handloom fabric. So, a handicraft *haat* has been proposed just outside the municipal limits along NH15 near Children's Park to showcase the region's traditional handicraft and culture. Tourists can get information about the handicrafts of the area and can directly buy authentic products from local weavers.

It is expected that this handicraft haat will boost the market linkages for sericulture in the area. Different workshops for handloom and other traditional handicrafts are proposed for tourists in this haat. The main aim of the proposal is to increase employment opportunities for local people and provide skill development programs for traditional weavers. Economic growth will be helpful in promoting local crafts, handicrafts, live pottery, etc. for tourists.

20.4 Eco-Village

As the town lacks in terms of its tourist attractions and good quality hotels, an Eco Tourist Village resort is proposed near Jiadhal River and the Reserved Forest area towards north-eastern direction of the town. Eco-tourist village will provide facilities for stay of tourists away from the town, and near a beautiful landscape of forests, rivers and hills. Different recreational activities could be proposed along the river related to water sports and trekking, camping and cycling activities. This resort will be based on traditional architecture, village life and shall involve village activities for tourists. The resort will give a glimpse of the village life in the form of traditional stilt houses, ponds for fishing, animal husbandry and other related activities.

Figure 20.2: Conceptual Images for Eco-village



Source: SPA New Delhi (2022).

20.5 Tourist Information Centre

A Tourist Information Centre is proposed in the town near the Children's Park, as there is no such office located in the town currently. Different kind of tourist facilities such as basic civic amenities (public toilets, drinking water and bins), pamphlets for tourists, information related to tourist circuits and information related to other tourist attractions near the area would be provided in the Tourist Information Center. The center will also provide information about different tourist points, hotels and number of days required to cover these tourist attractions to enhance the tourists' experience.

20.5.1 River Tourism

Jiadhal River is located close to Dhemaji town. A number of picnic spots could be proposed near these water bodies and forest area. Different water sports, boating and cruises and fishing activities are proposed to promote river tourism in the area.

20.5.2 Tourism Infrastructure

Basic civic amenities should be improved in Dhemaji town to enhance tourists' experience. Proper signage need to be provided for guiding tourists and residents in the town. Hotels, guest houses, home stay facilities, parking, connectivity and basic infrastructure provisions such as drinking water and public toilets need to be improved. Organizing traditional festivals and conservation of temples as a part of the religious tourism is a great way for the town to generate revenues.

Publicity and development of tourist places by ensuring adequate facilities are important for the promotion of tourist development for which the town needs additional resources and planning. In the initial phases, state government should help the town develop this infrastructure.

CHAPTER 21: ENVIRONMENT AND DISASTERS

21.1 Introduction

In times of climate change, environmental protection has become increasingly important. As disasters are becoming common as well as lethal phenomena, it is necessary to take adequate measures to prevent economic, social and environmental losses. Since Dhemaji is prone to torrential rains that can cause floods in a short period of time, the Master Plan 2041 attempts to make proposals to decrease the impact of such disasters in the area.

21.2 Conservation of Natural Drains

Several rivers and rivulets flow through Dhemaji. Jiadhal is the most significant river that flows close to the Planning Area but has caused devastating floods in the past. Small streams like Eradhal and Telijan run through the town and act as key drainage channels. However, over the years, these streams have begun to dry up and carry water only during the monsoon rains. One reason behind this is the encroachment of these rivulets by the local residents and commercial structures have sprung up around these rivers which make a negative impact on the streams' flow in the long run, exacerbating the problem of urban floods. As a result, it is important to take the necessary steps to protect these drainage channels by implementing the following proposals.

21.2.1 Buffer Zone

Buffer zones around water bodies serve as barriers, shielding humans from the negative effects of flooding in the area. In general, a buffer zone is an area surrounding a natural resource that is intended to mitigate the influence of one land use on another. The width of the buffer is determined by a number of criteria, including the type of water resource, soil type, slope, and land use. The effective breadth of the buffer, on the other hand, is dependent on the ecological function that the buffer is anticipated to accomplish.

The drainage pathways in the town area are around 10 m to 20 m wide. As a result, a 100-meter buffer on both sides of the stream is proposed where settlements have yet to emerge as shown in Figure 21.1.

Rooftop rainwater harvesting is a method of collecting rainwater at the household level and storing it in subterranean reservoirs or utilising it directly. Ground water levels are supplemented by the storage structures.

Rooftop rainwater collection is a possible option because a large amount of the streams' catchment is built-up and the area receives on average annual precipitation of 3,268 mm. Such methods help to supplement the groundwater levels to a great extent after and before the monsoon rains.

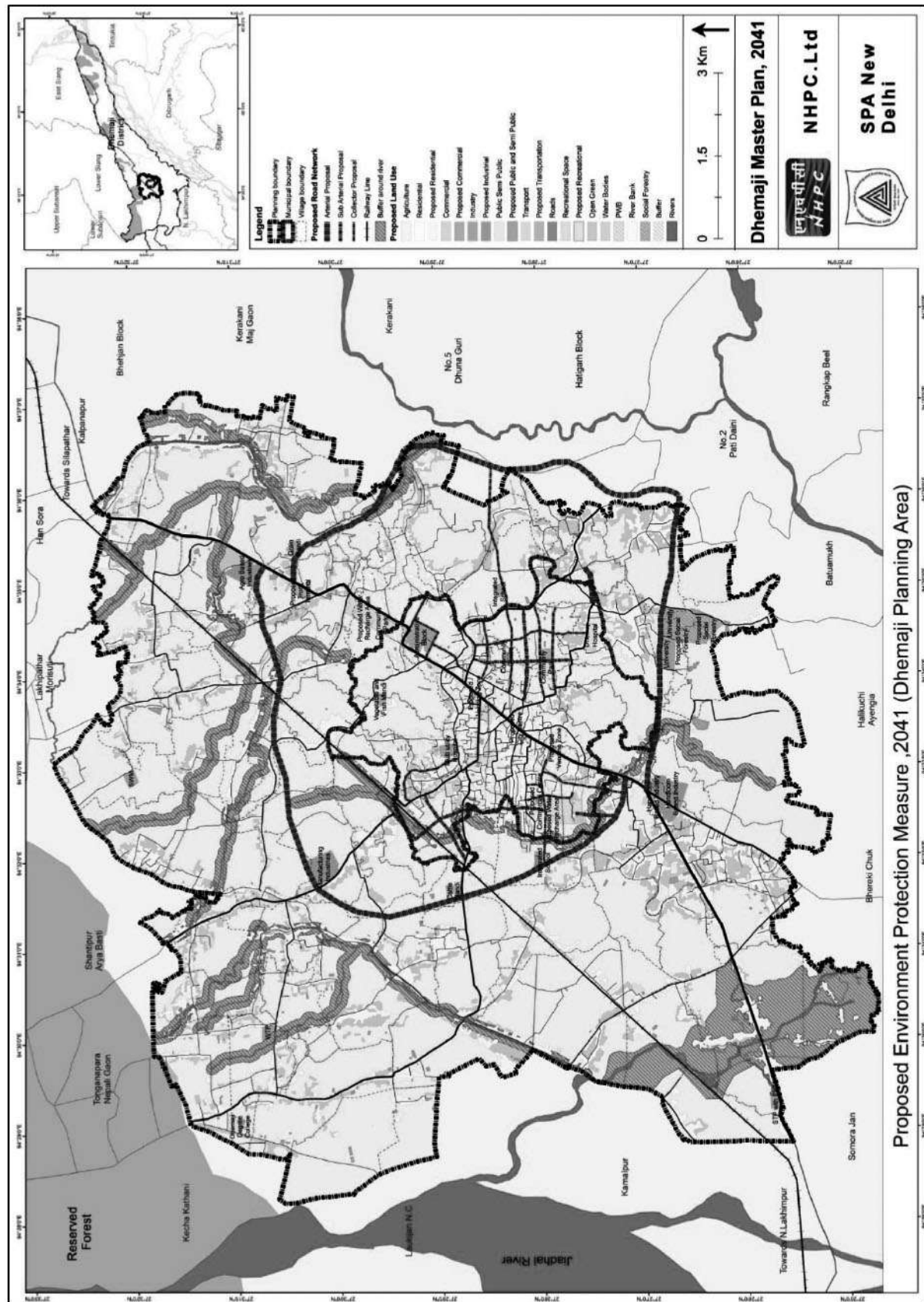
21.2.2 Greening the Ecotone

The transition zone between two biomasses is referred to as an ecotone. The ecotone in a riverine ecosystem is the area between the river and the adjacent land. An ecotone is characterised by a higher density and diversity of organisms that rely on it for survival. As a result, maintaining the ecological health of a river necessitates the protection of the land surrounding it. A considerable portion of the ecotone has been encroached around Eradhal and Telijan. This is why, as previously discussed, a buffer zone must be established. Within the ecotone, suitable tree species that are native to the area should be planted. This will aid in the restoration of the riverine ecology.

21.3 Erosion Protection Measures

Jiadhal River, which flows close to the Planning Area, is extremely prone to erosion. With a catchment area of 533.48 sq km, the river drains a significant area of land in and around Dhemaji. To reduce the negative effects of erosion, certain measures have been proposed which will help limit the flow of runoff directly into the river. These measures are:

- Trees should be planted along the riverbanks. To stabilise banks and bamboo species that are effective soil binders should be used.
- Sandbags are an inexpensive solution to prevent erosion in vulnerable areas. This should be used.
- Porcupine reinforced bars should be used to slow down the river's flow velocity.

Figure 21.1: Proposed Environment Protection Measures, 2041

Source: SPA New Delhi (2022).

CHAPTER 22: PROPOSED LAND USE

22.1 Introduction

Like any master plan, Master Plan for Dhemaji 2041 also culminates in the proposed land use plan for the horizon year 2041. It is in this proposed land use plan that all proposed land uses, networks, and facilities are presented to provide a comprehensive view of how the town would develop till 2041. Proposed land use plan shows condition of Dhemaji town in 2041.

22.2 Land Use Distribution

The proposed land use distribution for horizon year 2041 is given in Table 22.1. Total developed land is 49.88 sq. km in the Dhemaji Planning Area.

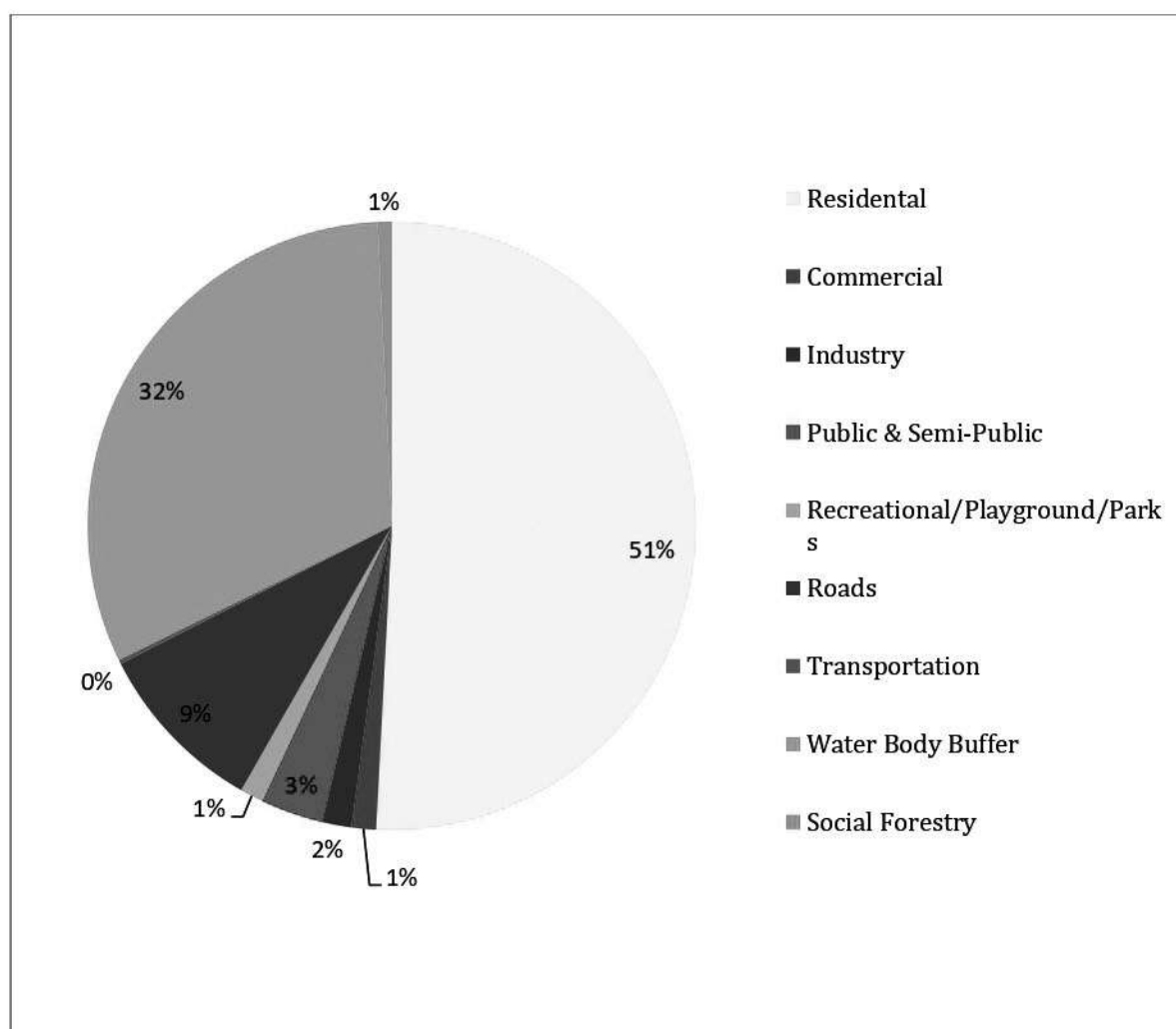
Table 22.1: Proposed Land Use Distribution for Dhemaji Master Plan, 2041

Sl.No.	Proposed Land Use	Municipal Area		Planning Area		Percent of Developed Area
		Area (Sq. Km)	Percent of Municipal Area	Area (Sq. Km)	Percent of Planning Area	
1	Residential	9.16	48.71	25.35	17.84	50.82
2	Commercial	0.40	2.14	0.65	0.46	1.31
4	Industry	0.01	0.05	0.77	0.54	1.55
5	Public & Semi-Public	0.79	4.18	1.66	1.17	3.34
6	Recreational/Playground/Parks	0.33	1.77	0.62	0.44	1.25
7	Roads	1.26	6.72	4.62	3.25	9.26
8	Transportation	0.04	0.23	0.11	0.08	0.22
9	Water Body Buffer	0.51	2.70	15.71	11.06	31.50
10	Social Forestry	0.00	0.00	0.38	0.27	0.75
	Developed Area	12.50	66.50	49.88	35.11	100.00
11	Agriculture	5.20	27.67	80.60	56.74	
12	Water Body	0.20	1.07	2.09	1.47	
13	Open Space/Grassland	0.89	4.76	9.50	6.68	
14	Reserve Forest	0.00	0.00	0.00	0.00	
	Undeveloped Area	6.30	33.50	92.19	64.89	
	Total	18.80	100.00	142.06	100.00	

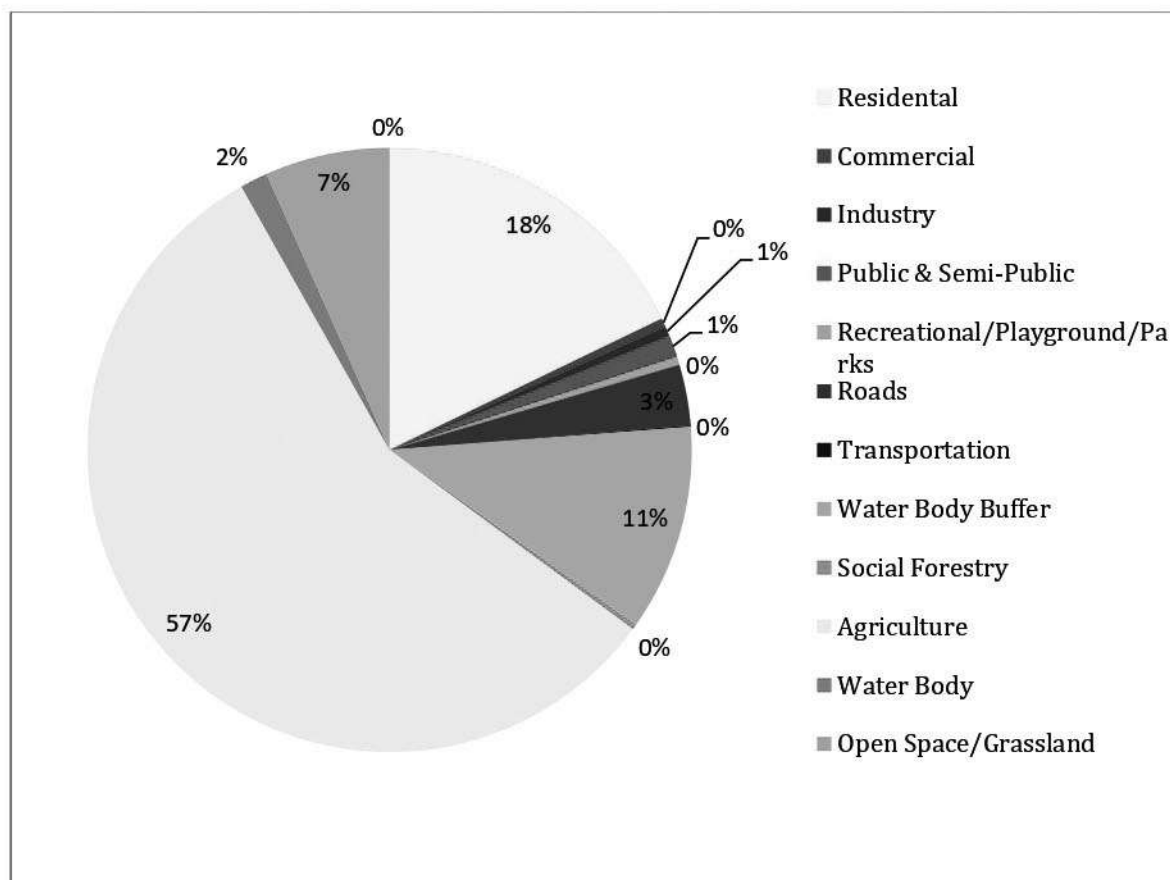
Source: SPA Delhi (2022).

Proposed developable land amounts to 35.11 percent of the land of the Planning Area. The proposed developable land use classification is in accordance with the URDPFI Guidelines, 2015. Figure 22.1 and Figure 22.2 provide a graphical representation of the land use distribution in Dhemaji Planning Area, 2041. Each land use describing the major proposals is detailed out in the subsequent sections.

Figure 22.1: Land Use Distribution of Developable Land in Dhemaji Municipal Area, 2041



Source: SPA New Delhi (2022).

Figure 22.2: Total Land Use Distribution in Dhemaji Planning Area, 2041

Source: SPA New Delhi (2022).

22.3 Residential

Based on demographic projections, an additional area of 5.89 Sq Km of land is proposed for residential development. Plotted housing will continue to be the only housing typology in the Planning Area. NH15 divides Dhemaji town into two parts. From temporal geospatial analysis, it has been found that growth of Dhemaji town has been proceeding towards the west that is near the Station Road. In the eastern part, the PNGB Road and Civil Hospital Road form a loop. Residential development has been only taking place along these roads. The area within the loop remains relatively undeveloped. This has led to leap frog pattern of development. For balanced development of the town, proposed residential area has been recommended primarily in the eastern direction. To facilitate the development of residential area, grid iron pattern of road network has been proposed. Considering the direction of growth, a smaller chunk of residential area is also proposed in the western direction. Proposed residential area is integrated with the existing developments.

22.4 Commercial

Existing government offices in the core of the town cause congestion, thereby reducing accessibility for other amenities. These spaces have potential to be transformed into commercial use after shifting government offices towards the north of the town. This will generate additional revenues for government. Commercial area is also proposed along NH15 and Station Road up to a width of 50 m on both sides. Informal market that is vending zone is proposed in the old bus stand area in the core of the town. Two Local Shopping Centres have also been proposed in the residential area.

22.5 Industrial

From an industrial perspective, the agro-based economy of Dhemaji provides room for the development of agro-based industries such as rice mills, oil manufacturing, etc. For this, land measuring 20 hectares has been allocated towards the north of the Planning Area. Automobile-based small-scale workshops have sprung along NH15, particularly in the outer wards. Apart from this, a significant number of manufacturing industries for metal fabrication, wooden furniture, bamboo items, etc. are present in the Planning Area. This is indicative of the fact that there is a scope for future development of similar industries in this sector. So, 25 hectare of land has been allocated for manufacturing industries in the vicinity of Dhemaji Railway Station. It has been kept away from the town to protect residential areas from the resultant air and noise pollution. Since there is ample production of silk in Dhemaji, handloom based small and medium scale industries have been proposed towards the south of the town on an area of 34 hectare. A total of 79 hectares of land has been allocated for industrial use.

22.6 Public Semi Public

Government offices are presently spread unevenly across the entire town. Sprawling commercial areas, existing government offices and bus stand have caused congestion in town's core. To resolve this issue, Master Plan 2041 has proposed an integrated Administrative Complex to house all government offices at one place. 20 hectares of land has been allocated for this with immediate accessibility to NH15. To enable overall development and wellbeing of citizens of Dhemaji Planning Area, adequate facilities for education, health and wellbeing, socio-cultural development and recreation are

proposed. A university covering 30 hectares of land is proposed in Telijan. Two integrated schools have been also proposed on either side of NH15.

22.7 Transportation

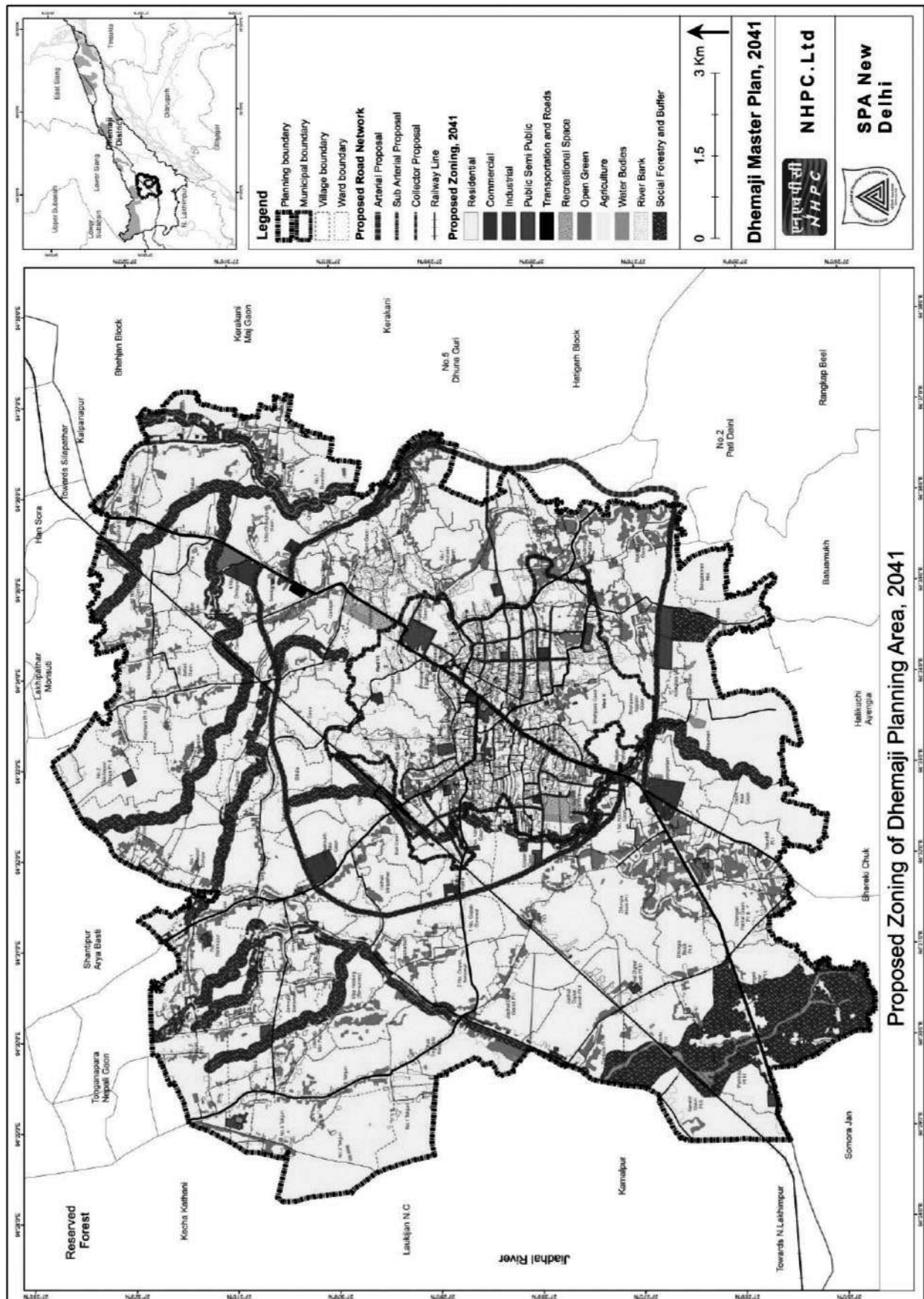
Dhemaji Master Plan 2041 aims to enhance connectivity within as well as outside Dhemaji Municipal Area. The proposed Bypass provides accessibility to all major proposed developments. Grid iron pattern of road network has been proposed within the Municipal Area. The existing bus stand is being shifted towards the south in the outskirts of the town along NH15. Additional area of 5 hectare has been allocated to upgrade the bus stand to function as an Inter State Bus Terminal.

22.8 Open Spaces

Dhemaji town lacks organized green spaces. Currently, the town has a Children's Park and a Courtfield, both are located along NH15. The Master Plan proposes 30 hectares of land for District Park to be developed in Ward 5 which could be developed as a theme park with suitable landscaping features. The existing Children's Park is extended to include coherent activities like handicraft *haat* and tourist information centre. It has the potential to be developed as a tourist destination. Two community parks have also been proposed in the Municipal Area as organized open spaces for recreation.

22.9 Agriculture

Agriculture remains the primary occupation in villages within the Planning Area. Therefore, revamping the agriculture sector is necessary. Emphasis should be placed on enhancing irrigation facilities and provision of government schemes and incentives to make agriculture lucrative to farmers. Further, farmers should be facilitated to grow commercial crops which could further be used in food-processing industries. Figure 21.3 depicts the Proposed Land Use for Dhemaji Planning Area, 2041.

Figure 22.3: Proposed Zoning for Dhemaji Planning Area, 2041

Source: SPA New Delhi (2022).

[illegible]

Source: SPA New Delhi (2022).

DEVELOPMENT CONTROL RULES AND REGULATIONS

CHAPTER 23: DEVELOPMENT CONTROL RULES AND REGULATIONS

23.1 Introduction

Development control is as significant as making spatial planning proposals. It is in this direction that this chapter focuses on development control rules and regulations which forms the second most important part of the Master Plan for Dhemaji, 2041. Development control rules and regulations facilitate, control, and regulate 'development'. The term development is itself defined in relevant planning act.

The purpose of the development code is to ensure health, safety, and security by placing activities in a manner to minimize long-term harmful effects and optimize the beneficial effects. The code provides a system of classification of land uses based on predominant functions. Following sections discuss a system of classification, permissibility, and development control rules and regulations at city and premise level.

23.2 System of Classification: Use Category, Use Zones and Use Premises.

Dhemaji Planning Area is divided into 8 land use categories and 27 use zones. Each land use category is further sub-divided into use zones based on the different character of an activity within a use category, which shall be further subdivided into use premises. Each use premise shall be permitted to have specific uses and use activities out of the prescribed uses and use activities with or without conditions.

Unless the context otherwise requires, in this code, use zone means an area for any one of the specific dominant uses of urban functions. Use premise means one of the many sub-divisions of a use zone, designated at the time of preparation of a layout plan for a specific main use or activity and includes the use premise described.

Layout plan means a sub-division plan indicating configurations and sizes of all use premises. This plan is meant to detail out the various provisions of the Master Plan for Dhemaji town. As is evident from Table 23.1, use categories and use zones are explicated.

Table 23.1: Proposed Use Category and Use Zones

Use Category	Use Zone
Residential (R)	R1: High Density Residential (50 - 100 pph)
	R2: Medium Density Residential (30 - 50 pph)
	R3: Low Density Residential (< 30 pph)
Commercial (C)	C1: Retail Commercial
	C2: Wholesale Commercial
Industrial (M)	M1: Small and Medium Scale Industries
	M2: Light Industry
	M3: Medium Industry
Public and Semi-Public (PS)	PS1: Hospital
	PS2: Education and Research University / University centre, College,
	PS3: City level Social - Cultural, Socio-Cultural Complex/ Centre, Religious, exhibition ground
	PS4: Police / Police Headquarter / Police Lines, Fire Stations / Disaster Management Centres,
	PS5: Burial Ground / Cremation Ground
	PS6: Transmission site/telecommunication
	PS7: Government Offices/Courts
Recreational and Open Spaces (P)	P1: City/Community level Park
	P2: City/Community level Playgrounds
	P3: Organised green along roads
Transportation (T)	T1: City Bus Terminal/Bus Depot/Truck Terminal/Railway station
	T2: Road/Rail network
Utilities (U)	U1: Water (Treatment Plant etc.)
	U2: Sewerage (Treatment Plant etc.)
	U3: Electricity (Powerhouse, Sub-Station etc.)
	U4: Solid Waste (Sanitary landfill etc.)
	U5: Drain
Green, Agriculture and Water Bodies (A)	A1: Agriculture/Green Belt
	A2: Water bodies/fisheries
	A3: Plant nursery/plantations
	A4: Dairy Farm/Poultry Farm/Piggery

Light Industries are those which do not emit excessive smoke, noise, offensive odor, or harmful industrial wastes and these industries would be encouraged. These industries would employ not more than 100 workers and use power not more than 100 HP. Medium Industries are those which employ more than 100 workers.

23.3 Use Premises and Permissible Activity

Use premises and permissible activities in relation to different land uses are proposed in a comprehensive manner in the form of a matrix (see Table 23.2). Each use premise is also uniquely coded for the purposes of comprehensibility.

Table 23.2: Definition of Use Premises and Permissible Activity

Use Premise	Code	Definition and Content	Permissible Activity
Residential			
Residential Plot	R001	A premise for one or more than one dwelling unit and may have on it one main building block and one accessory block for garage/garages and servant quarters.	Residence, plantation, vegetable garden, pond, onsite biodegradable solid waste management facility.
Residence cum Work Plot	R002	A premise for one or more than one dwelling unit and may have on it one main building block and one accessory block for garage/garages and servant quarters has workspace on the ground floor.	Residence, Workspace for Retail Shop, Household Industry and Personal Service Shop in areas specified in land use plan or layout plan.
Residential Plot for Group Housing	R003	A premise of size not less than 3,000 sq m intended for built-up multi-storeyed residential flats with basic amenities like parking, park, shops for daily needs, public utility.	Residential Flat, Retail Shop of Confectionery Grocery and General Merchandise, Books and Stationery, Chemist, Barber, Laundry, Tailor, Vegetable Shop (On ground floor with an area up to 15 sq. m each.), Crèche and Day Care Centre on ground floor with an area up to 50 sq m.
Hostel	R004	A premise in which rooms attached to 'Institutions or otherwise are let out on a long-term basis.	Hostel, Guest House, Boarding House, and Lodging House, Watch and Ward Residence (20 sq m), Service Shops (15 sq m)
Orphanage	R005	A premise with facilities for boarding of children who are bereaved of parents. It may or may not have educational facilities.	Orphanage, Residential Flat (For maintenance staff). Hostel, Service Shop (Up to 15 sq m)

Use Premise	Code	Definition and Content	Permissible Activity
Dharamshala	R006	A premise providing temporary accommodation for short duration on no profit basis.	Dharamshala, Service Shops, Soft Drink and Snack Bar (up to 15 sq m)
Night Shelter	R007	A premise providing night accommodation to individuals without any charges. It may be run by government or voluntary agencies	Rooms, Dormitories, Office, Soft Drink and Snack Bar
Guest House	R008	Guest House is a premise where a residential house has been converted into an accommodation for short term stay of visitors.	Residence, Guest House, Retail and Service Shop and Office restricted to 5 per cent of total floor area.
Commercial			
Retail Shop	C001	A premise for sale of commodities directly to consumer with necessary storage.	Retail Shop
Repair Shop	C002	A premise equivalent of a retail shop for carrying out repair of household goods, electronic, gadgets, automobiles, cycles etc.	Repair Shop
Service Shop	C003	A premise equivalent of a retail shop providing services like tailor, barber, Photocopies etc.	Service shop
Vending Booth	C004	A premise in the form of booth for sale of commodities of daily needs either through a mechanical installation or otherwise	Vending Booth,
Shopping Centre/Market Area	C005	A premise having a number of built-up commercial shops. It may include offices and other facilities as per the hierarchy of shopping centre defined in the master plan.	Retail, Repair and Personal Service Shop, Restaurant, Office, Micro and small industry, Clinical Laboratory, Clinic and Poly Clinic, Soft Drink and Snack Stall, Post Office and Bank, Extension Counter, Nursing Homes, Public toilet facility.
Weekly Market/ Informal Sector Unit	C006	An area used once in a week by group of informal shop establishments in the form of	Weekly Market, Informal Retail Trade, Soft Drink and Snack

Use Premise	Code	Definition and Content	Permissible Activity
		market. These markets shift from one area to another on different days of the week	Stall (All structures will be either temporary or mobile, only for one day in a week), Public toilet facility.
Informal Unit	C007	Retail/service unit, stationary or mobile, working without roof including small <i>khokhas</i> on roadside	Informal Unit
Wholesale Market	C008	A premise from where goods and commodities are sold delivered to retailers. The premise includes storage godowns and loading and unloading facilities.	Wholesale Shop, Godowns and Storage, hostel, night shelter, Commercial Offices (restricted to 25 per cent of the total floor area), Public toilet facility.
Storage, Godowns and Warehousing	C009	A Premise for exclusive use of storage of goods and commodities in a manner as per the requirements of respective commodities. The premise includes the related loading and unloading facilities by Road Transport or Rail Transport as the case may be	Storage, Godowns and Warehousing, Watch and Ward Residence (Up to 20 sq m) Wholesale Outlet, Administrative and Sales Office.
Cold Storage	C010	A premise where perishable commodities are stored in covered space using mechanical and electrical device to maintain the required temperature etc.	Cold Storage, Watch and Ward Residence (up to 20 sq m) Administrative Office.
Commercial Office	C011	A premise used for offices of profit-making organisations.	Commercial Office, Retail and Personnel Service Shop; Restaurant; Bank.
Bank	C012	A premise for offices to perform banking function and operation.	Bank, Watch Ward Residence (up to 20 sq m), Commercial Office, Canteen.
Motor Garage and Workshop	C013	A premise for servicing and repair of automobiles.	Motor Garage and Workshop, Retail Shop (spare parts), Soft Drink and Snack Stall.
Cinema	C014	A premise with facilities for projection of movies with a	Cinema, Watch and Ward Residence (20

Use Premise	Code	Definition and Content	Permissible Activity
		covered space to seat audience.	sq m) Administrative Office, Soft and Snack Stall, Retail, Shop and Commercial Office (up to 20 per cent of the total floor area).
Petrol Pump	C015	A premise for sale of petroleum products to consumers. It may include servicing of automobiles.	Petrol Pump, Soft Drinks and Snack Stall, Automobile Repair Shop.
Restaurant	C016	A premise used for serving food on commercial basis including cooking facilities. It may have covered or open space or both for sitting arrangement.	Restaurant
Hotel	C017	A premise used of lodging of 15 persons or more on payment with or without meals for short term duration.	Hotel, Retail and Service Shop and Commercial Office restricted to 5 per cent of total floor area.
Junk Yard	C018	A premise for covered semi-covered or open storage including sale and purchase of waste goods, commodities, and materials	Junk Yard, Watch and Ward Residence, Sales Office.
Manufacturing			
Industrial Plot	M001	A premise for micro, small and medium scale industrial unit	Industrial unit, Administrative Office, Sales Outlet, Residential Flat to the extent of 5 per cent of the floor space or 50 sq m whichever is lies for watch and ward and supervision.
Public and Semi-Public			
Government Offices			State and central government offices, local and municipal offices, radio and wireless station,
Hospital	PS001	A premise providing medical facilities of general or specialised nature for treatment of indoor and outdoor patients.	Hospital, Residential Flat (Employees and services personal), Institutional Hostel, Medical College, Retail Shop

Use Premise	Code	Definition and Content	Permissible Activity
Health Centre	PS002	A premise having facilities for treatment of indoor and outdoor patients having up to 30 beds. The health centre may be managed by a public or a charitable institution on non-commercial basis. It includes family welfare centre.	(Confectionery, grocery and general merchandise, books and stationery, chemist, barber, launderer; vegetable) Health Centre and Nursing Home, Health Centre, Nursing Home, Watch and Ward Residence (up to 20 sq m each), Chemist Shop (up to 15 sq m each).
Nursing Home	PS003	A premise having medical facilities for indoor and outdoor patients having up to 30 beds. It shall be managed by a doctor or a group of doctors on commercial basis	Dispensary, Soft Drink and Snack Stall. Clinic.
Dispensary	PS004	A premise having facilities for medical advice and provision of medicines managed by public or charitable institutions.	Dispensary, Soft Drink and Snack Stall. Clinic.
Clinic	PS005	A premise with facilities for treatment of outdoor patients by a doctor. In case of a polyclinic, it shall be managed by a group of doctors	Clinical Laboratory, Soft Drink and Snack Stall.
Clinical Laboratory/Diagnostic Laboratory	PS006	A premise with facilities for carrying out various tests for confirmation of symptoms of a disease.	
Crèche and Day Care Centre	PS007	A premise having nursery facilities for infants during daytime. The centre may be managed by an individual or an institution on commercial or non-commercial basis.	Crèche and Day Care Centre, Watch and Ward Residence (up to 20 sq m)
Nursery and Kindergarten School	PS008	A premise with facilities for training and playing for children preparatory to the school.	Nursery and Kindergarten School, Watch and Ward Residence (up to 20 sq. m.) Crèche and Day Care Centre
Primary School	PS009	A premise having educational	Primary School, Watch